

AFOTEC

AIR FORCE OPERATIONAL TEST AND EVALUATION CENTER



SPACE OPERATIONAL TEST AND EVALUATION MODEL (SOTEM) HANDOUT

9 MARCH 2010

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TABLE OF CONTENTS

Section 1. Commander's Letter

Section 2. Space Operational Test and Evaluation Model Description and Briefings

Section 3. International Test and Evaluation Association Article & T&E Days Paper.

- Improving AFOTEC's Contribution to the Acquisition Process: Moving Integrated Developmental and Operational Test to the Next Level. (Maj Gen Stephen T. Sargeant)
- From Early Influence to Dedicated OT&E: A New Model for Optimizing Space System T&E (Major Ken Bole, Major Kerri Uhlmeyer, & Captain Russell Putney)

Section 4. Space System OT&E.

- Test and Evaluation Activities and Documentation by Acquisition Phase

Section 5. Test Directors Operational Test Toolkit.

Section 6. Special Topics

- Applying Design of Experiments for Operational Test
- The Program Manager's Review Cycle for Certification of System Readiness for Dedicated Operational Testing
- AFOTEC Space OT&E Successes



FROM THE COMMANDER

When our Airmen go to war they require the weapon system capabilities their commanders requested to defeat an enemy. Therefore, we will ensure they receive those capabilities at the right time and with confidence in their ability to accomplish the mission. The Air Force Operational Test and Evaluation Center (AFOTEC) is responsible for providing balanced and timely test and evaluation of Air Force warfighting capabilities' operational effectiveness, suitability, and mission capability.

The Space Operational Test and Evaluation Model (SOT&EM) was developed to provide the basis for knowledge-based acquisition and operational decisions throughout the life cycle of our national security space systems. It identifies early test, evaluation, and reporting activities to inform acquisition and operational decisions, providing a roadmap for early program influence. SOT&EM also provides an overarching model for each individual program's tailored implementation.

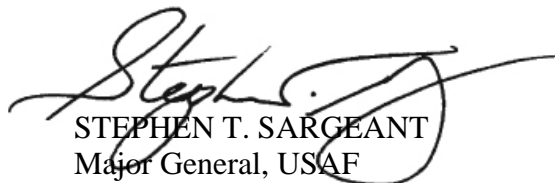
Early influence is a key SOT&EM tenet. Early influence is our formalized approach to refine capability requirements and acquisition strategies, as well as to develop early integrated test and evaluation strategies and plans. Early influence is based on the premise that issues discovered early, often before a formal program exists, are more easily resolved and at less cost in terms of time and money. By institutionalizing the early influence approach, we are helping to stress and refine requirements from a testability and measurability standpoint, in order to provide an effective, suitable, and mission capable warfighting capability.

The *International Test and Evaluation Association (ITEA) Journal* recently published an article addressing the effectiveness of AFOTEC's early influence in the Air Force acquisition process, space system operational testing, and IDT/OT. The article illustrates the processes used and benefits gained from early and continuous interaction with the operational tester. The article forms the foundation for AFOTEC's involvement across the spectrum of acquisition programs and test directors are the key to ensuring our TEams continue to reap the benefits.

The checklist from the AFOTEC Test Director's Operational Test Toolkit details operational test and evaluation (OT&E) activities and events throughout the acquisition process.

The purpose of the SOT&EM Toolkit is to provide test teams with an overview of the activities required to conduct successful space systems operational test. Refer directly to published instructions, manuals and guides where appropriate for the latest complete guidance.

AFOTEC is fully committed to early and constant communication and coordination in the OT&E process to ensure effective, suitable, and mission capable warfighting capabilities are delivered to our Airmen and often Joint and Coalition partners when they need them.


STEPHEN T. SARGEANT
Major General, USAF
Commander

Section 2

SPACE OPERATIONAL TEST AND EVALUATION MODEL (SOT&EM)

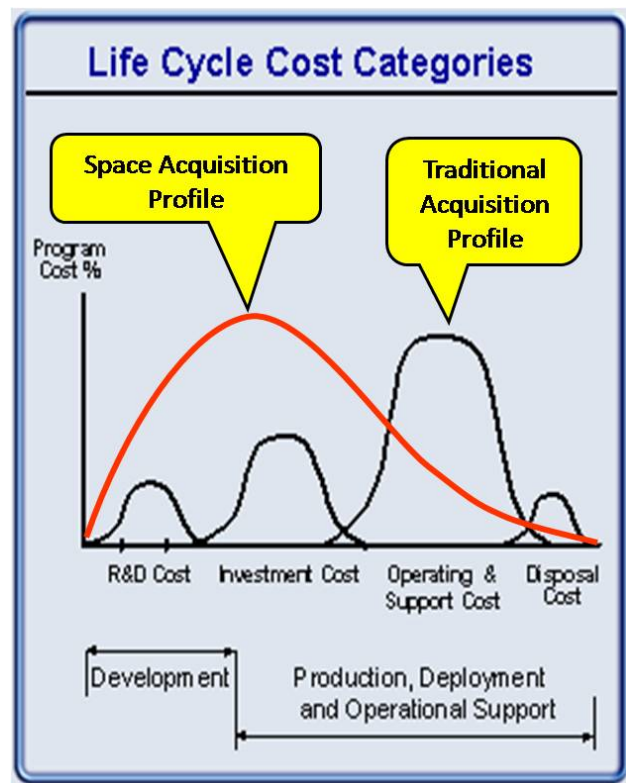
What is SOT&EM?

AFOTEC's Space Test and Evaluation Model (SOT&EM) provides the basis for knowledge-based acquisition and operational decisions throughout the life cycle of our national security space systems. SOT&EM creates a dynamic, flexible methodology that provides decision makers with high-quality, timely, fact-based information for key program decisions that also applies to the entire spectrum of acquisition programs. SOT&EM provides a framework for testing systems governed by National Security Space Acquisition Policy, Interim Guidance, 23 March 2009. SOT&EM identifies early test, evaluation, and reporting activities to inform acquisition and operational decisions, providing a roadmap for early program influence.

By Summer 2010, a Directive-Type Memorandum (DTM) will be issued that will rescind the Interim Guidance and establish a Space Systems Acquisition Policy as an addendum to DoDI 5000.02.

Why SOT&EM?

The benefits of the SOT&EM will be better space warfighting systems acquired through early, continuous integrated testing involvement, providing inputs to the requirements processes to ensure the system addresses the mission capability gap and informing early program decisions when changes are less costly. SOT&EM focuses the majority of the OT&E effort, conceptually 90 percent of the OT&E community's time, on pre-launch when it is still possible to affect changes to space segment. Early involvement from the test community will allow for more operationally realistic test scenarios to be injected into developmental testing while the system is still on the ground. With early and continuous involvement, we will ensure that leaders make conscious, fact-based decisions to send satellites into orbit and field new ground stations when the complete system-of-systems required to deliver warfighting capability is in place.



For over 20 years, AFOTEC and the other Service operational test agencies (OTA) conducted OT&E of space and other high-tech, limited quantity systems using a model more appropriate for military systems with production decisions for large-quantity buys. Using an OT&E model that does not match the system's acquisition strategy renders the results of OT&E largely irrelevant, and pertinent performance information comes late to need.

SOT&EM provides early operational involvement that will deliver a number of benefits, including: (a) ensuring the warfighter receives needed mission capabilities, (b) providing early clarity and continued update of operational requirements, (c) influencing early and continual development and refinement of the Concept of Operations, (d) ensuring frequent reviews of threat documents to ensure the system design addresses current threats, (e) highlighting program shortfalls and benefits throughout the development process when they

can be addressed most efficiently and inexpensively, (f) enabling the user to understand and accept acquisition risks and adjust their mission requirements and plans accordingly, (g) addressing and correcting systemic suitability issues early in the program development, and (h) operationally and threat realistic ground testing of space systems.

Early Influence

One of the key tenets to the success of SOT&EM is Early Influence.

Early Influence is an approach adopted by AFOTEC for engaging and teaming with the user and acquisition communities to reduce program risk and support delivering mission capable systems to the warfighter. In addition, early influence enables AFOTEC to identify programs for possible involvement.

The space system T&E approach is based on early influence of the developmental and operational test community in the space system acquisition process. The Space Interim Guidance acquisition model is “front loaded” with the key decisions on requirements, funding, and development. Requirements definition, acquisition planning and T&E planning must be started earlier for space systems than for non-space systems. Space T&E supports the MS decisions before “metal is bent” by providing early and continuous information and analysis about system progress toward meeting the critical operational issues (COI) and critical technical parameters (CTP). Early programmatic reviews and decisions are supported with operational assessments developed by the integrated test team (ITT).

Integrated Developmental and Operational Testing (IDT/OT)

Overall, SOT&EM enables better space warfighting capability acquisition through early and continuous integrated testing to ensure that systems address mission capability gaps, and enables early user and program office trade-off decisions when changes are less costly and more timely.

The test community can often positively affect a program’s cost–schedule–performance problems by making better use of limited resources to eliminate unnecessary duplication of test events, better assure systems are ready for operational testing, and reduce the overall time required for dedicated operational testing. Integration of developmental testing and operational testing improves efficiency and, in many cases, allows us to reduce the cost of dedicated OT&E. Early influence is essential to successful IDT/OT for all programs. Working with the DT community provides early access to data critical to our operational assessments. Our participation in the high performance teams (HPT) and ITTs is the key to setting the conditions for the most effective IDT/OT. The AFOTEC and program office leaders co-chair the ITT and therefore, can ensure the access to data. At AFOTEC, we are making IDT/OT a requirement for all programs. Successful IDT/OT needs three things: early and continuous collaboration between the warfighter (user), acquisition, and T&E communities; OT&E plans informed by DT execution; and acknowledgment by the Program Element Officer (PEO) and appropriate DT wing commander of the dependency of the OT&E plan on planned DT execution.

Other Considerations:

Warfighter / User Requirements

In addition to using acquisition and test & evaluation regulations, test teams must also understand how the using command develops warfighter needs and translate those into the various requirements and capabilities documents. Refer to AFI 10-601, AFI 10-604 *CAPABILITIES-BASED PLANNING*, and AFSPCI 10-604 *SPACE OPERATIONS WEAPON STSTEM MANAGEMENT*.

AFSPCI 10-604 *SPACE OPERATIONS WEAPON STSTEM MANAGEMENT* is especially useful to the test team to understand how Air Force Space Command develops space system requirements and how they test, accept, and field space and ground control systems for operational use.

AFSPCI 10-604 discusses several activities that AFOTEC may participate in to gather OT relevant data and inform key decisions. These are early system use, trial period and operational acceptance.

These activities are generally specific to space programs because partial capabilities are deployed and operationally used by warfighters well in advance of declaring initial operational capability (IOC).

Early System Use.

Early use of an asset (prior to formal operational testing/operational acceptance) may be considered if deemed advantageous and necessary to increase military utility with the understanding the asset is still in the developmental phase. Early Use Operations will be conducted in parallel with development and testing activities.

One example of a system being used prior to IOC is the Milstar Communication Satellite, Block-I. The first two satellites were named Developmental Flight Satellites (DFS) 1 and 2. Both satellites were used operationally as soon as they were launched and checked out on orbit. The names reflect that these first two Milstar satellites were designed to test and field new technologies and concepts. However, neither was regarded as simply “test” platforms.

Trial Period

A key activity for AFOTEC participation is during trial period. Trial periods can occur prior to, during, and/or following testing and evaluation, during which an operating organization becomes familiar with a system using operational techniques and procedures. Trial Periods are utilized to determine the ability of the operational unit to employ the system. Additionally they demonstrate to the operational commander that the unit can perform its designed operational mission or missions. The Trial Period is nominally 30 days but must be flexible due to unforeseen circumstances. The Trial Period Review Panel (TPRP) chaired by HQ AFSPC/A3 and of which AFOTEC is member, is used as a means of ensuring a system readiness to enter into and/or exit from

Trial Period. The TPRP’s decision to enter into and/or exit from the Trial Period will be documented and maintained by the Command Lead.

AFOTEC can often glean valuable test data from the trial period. It is incumbent on the test team, through the ITT, to ensure that operationally relevant scenarios are presented during trial period (as with all DT and OT activities.)

Operational Acceptance

Another activity of which AFOTEC provides information is Operational Acceptance (OA). OA is defined as the formal process by which the AFSPC/A3 (could be delegated) accepts responsibilities for new or newly modified capabilities. In essence, with OA the AFSPC/A3 declares the system is capable of supporting the mission as the new system of record. OA is at the completion of the operational testing. At this point, the users should be able to use the system with little or no risk. HQ AFSPC/A3 will prepare the OA letter for the AFSPC/A3 signature after the OT&E final out brief and completion of Trial Period.

Initial Operational Capability (IOC) and Full Operational Capability (FOC)

One of the most important functions of AFOTEC operational testing is to provide information on weapon system performance and mission capability to acquisition and using command decision makers. One of the key events that AFOTEC informs is declaration of the Initial Operational Capability (IOC). While AFOTEC does not typically inform Full Operational Capability (FOC), Major Command operational test organizations will provide that role.

IOC and FOC announce an initial or full operational capability of a new or upgraded system to unified commanders, higher headquarters and AFSPC organizations, as applicable. (For upgraded systems, IOC/FOC would only be needed if the system provides a significant new capability.)

AFSPC/CC is the sole authority to declare IOC or FOC for an AFSPC system and has delegated responsibility to the AFSPC/A3. IOC/FOC is declared when an acquired system meets the IOC/FOC Evaluation Criteria as defined in the system's Capability Development Document (CDD).

Test Infrastructure

Space-based and space-enabled systems offer some unique challenges to realistic operational test & evaluation. Program managers and test teams face the challenge of placing space-based systems into its intended environment prior to launch. Test infrastructure is limited for space-based systems, yet operational and threat realistic testing need to take place before sending the system into orbit. Coordinate closely and early with the program office to plan and budget access to test assets and ranges in order to find operationally realistic space environments on Earth. Model and simulation will need to be used to test those items that cannot be tested in physical environment.

Use on-Earth laboratories to support component, sub-system, and full system testing when it makes sense to do so. Some possible candidates include the various laboratories at the Arnold Engineering Development Center in Tennessee that can look at various phases of launch, orbit entry, on-orbit and deep-space effects for relatively small sized components or systems, to NASA's Space Power Facility in Ohio where the testers may be able to place a complete satellite into the world's largest vacuum chamber and perform complete environmental testing.



USAF Space Operational Test and Evaluation Model

Maj Gen Steve Sargeant
Commander, AFOTEC

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1



Purpose



- Provide an update on Space Operational Test and Evaluation Model (SOT&EM) and experiences to date



2



Overview



- Space OT&E Model Summary
- Acquisition Cycle
- Actions Accomplished
- Way Ahead

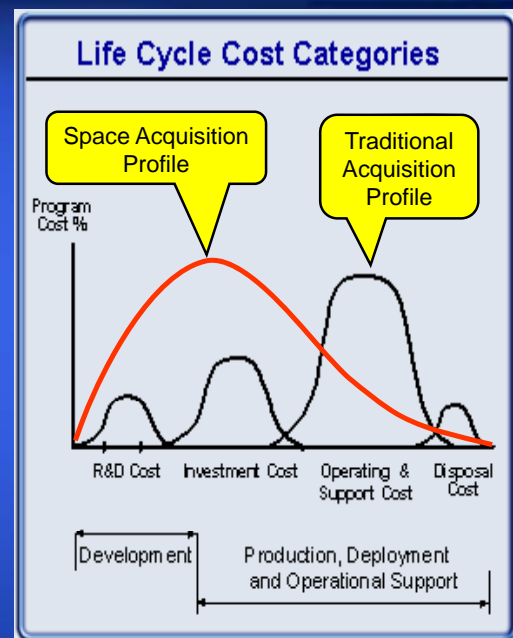
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Space OT&E Model Summary



- Acquisition & OT&E policy disconnect
- Early funding, early decisions
 - Front-loaded acquisition decisions
- Space OT did not inform acquisition decisions
 - Effort 90% post-launch
- Space OT&E model tenets
 - Maximize early influence
 - Integrated DT/OT throughout
 - Agile analysis and reporting
 - System-of-system evaluations



Space acquisition and test are now synchronized

4



Space OT&E Model Benefits



- Enables knowledge-based acquisition and operational decisions
- Increased early OT&E influence
 - Refines requirements and ensures testability and measureability
 - Increases confidence and reduces surprises
- Enhanced partnership between acquirers, testers & users for on time, on cost delivery of critical warfighter capabilities

Warfighter capability delivered faster, enabling Airmen, and often Joint and Coalition partners, to accomplish their missions more effectively with less risk

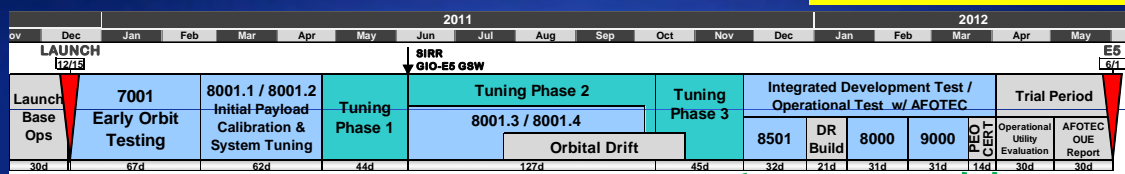
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Space Based Infrared System (SBIRS) GEO-1 Certification

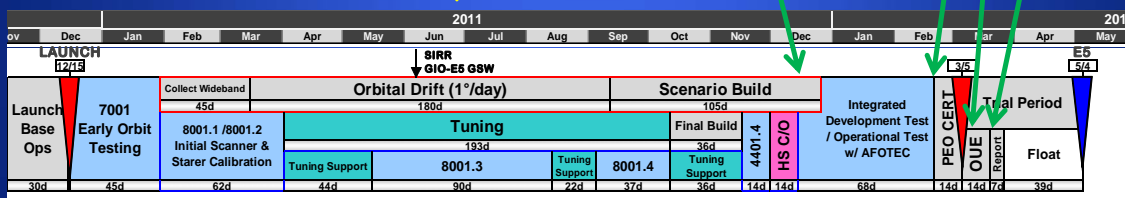


BEFORE SOT&EM



Certification timeline dominated by infrared tuning

Sequential test paradigm replaced with true integrated test



- Final integrated test (for evaluation) depends on completed tuning

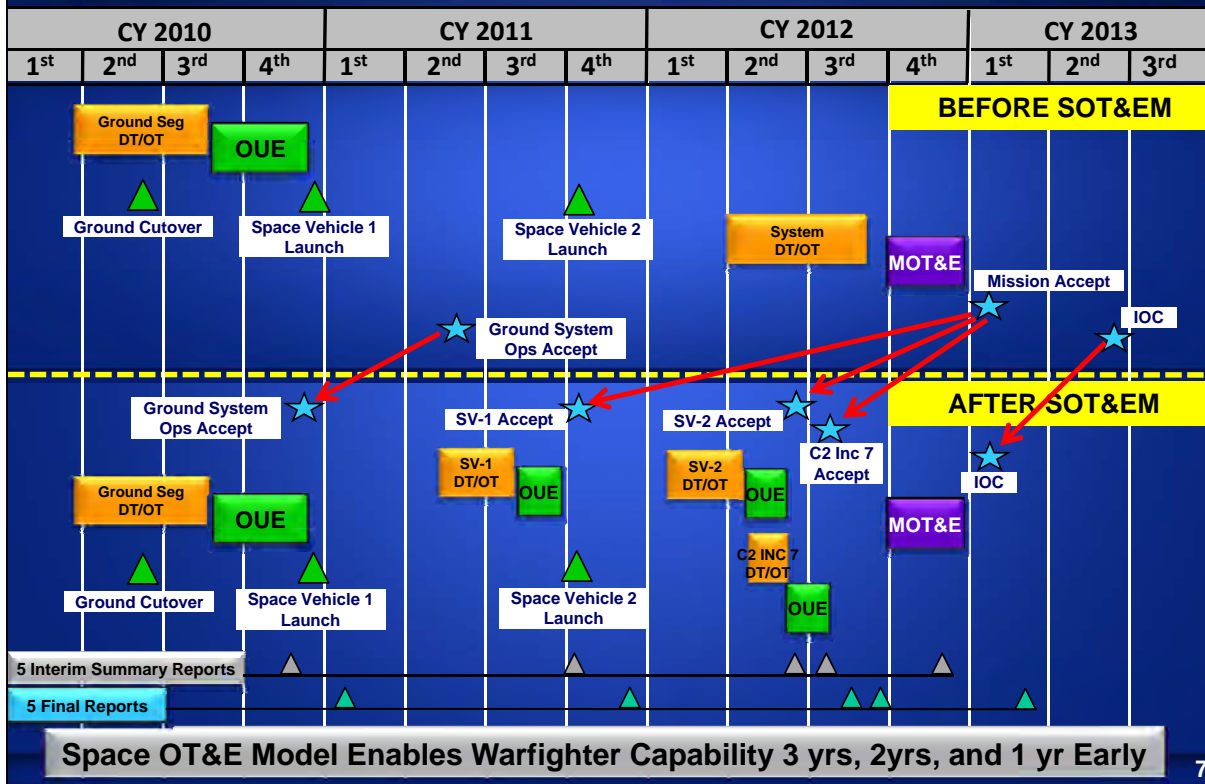
AFTER SOT&EM

Space OT&E model reduces testing time pre-OUE by 39% (114d to 68d) & OUE length by 50%

6



Advanced Extremely High Frequency (AEHF)



7



Enhanced Polar System (EPS)



- EPS EOA uncovered ambiguous and incomplete requirements
 - Quality of Service requirements were lacking
 - EPS community now working viable solutions
 - Over 30 operational requirements are being clarified
 - Currently coordinating with OTAs, program office and COCOMs
- EOA found STAR lacked current threat capabilities/tactics
 - OTAs formally submitted intelligence production request
 - System will be tested against realistic threats prior to delivery
- EPS program paving the way for Integrated DT/OT
 - Operational realism inserted early in program testing
 - Leveraging other program testing (AEHF and Navy terminals)
 - Unified effort by program offices, developers, services and OTAs

8



Space Acquisition & Test Policy



- **USAF Guidance: AFI 99-103 Ch 8 published**
 - Acquisition decision points and test reports now synchronized
 - AFOTEC guidance updated
 - AFOTEC Test Handbook and Templates
 - Program Manager's Operational Test Toolkit
 - Draft SOT&EM pamphlet
- **NSS 03-01 Rescinded**
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 - AFOTEC drafted DoD level companion annex for DoDI 5000.02

9



Way Ahead



- **Institutionalize template for all space acquisitions**
- **Continue coordinating space test policy to better integrate with acquisition processes**
- **Optimize ground station and satellite test procedures**
 - AFOTEC re-organizing to better support
- **Improve Information Assurance testing for space-enabled systems**
 - Must design in IA capabilities/requirements/testing early on vice add-on at fielding
- **Identify, develop, and use operationally realistic environments on Earth for OT&E prior to launch**

10



Space Environment Labs



- Operational environment for immature systems
- Test Infrastructure
 - Test transmit and receive functions
 - Radiation effects / space environment degradation
 - Simulate threats
 - Physical performance of sensor
 - Jamming / interference
- Preparing to use on-Earth labs
 - Government or Civilian
 - Candidates:
 - Arnold Engineering Development Center, TN
 - NASA Plum Brook Station - Sandusky, OH



11



Summary



- The Space OT&E Model is now in line with space acquisition and paying dividends
- Space acquisition policy includes Space OT&E Model
- We are institutionalizing the model
- AFOTEC is committed to collaboration with DT community to increase confidence in capabilities through IDT/OT

12



Questions?



AFOTEC Update on USAF Space Operational Test and Evaluation Model

Maj Gen Steve Sargeant
Commander, AFOTEC

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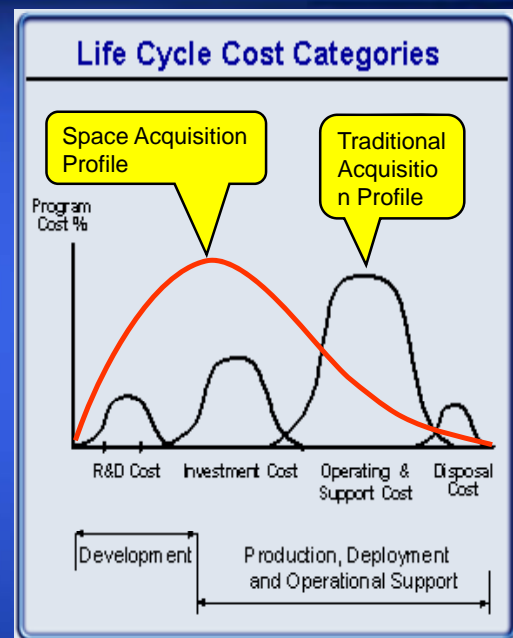
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4



Space OT&E Model Benefits



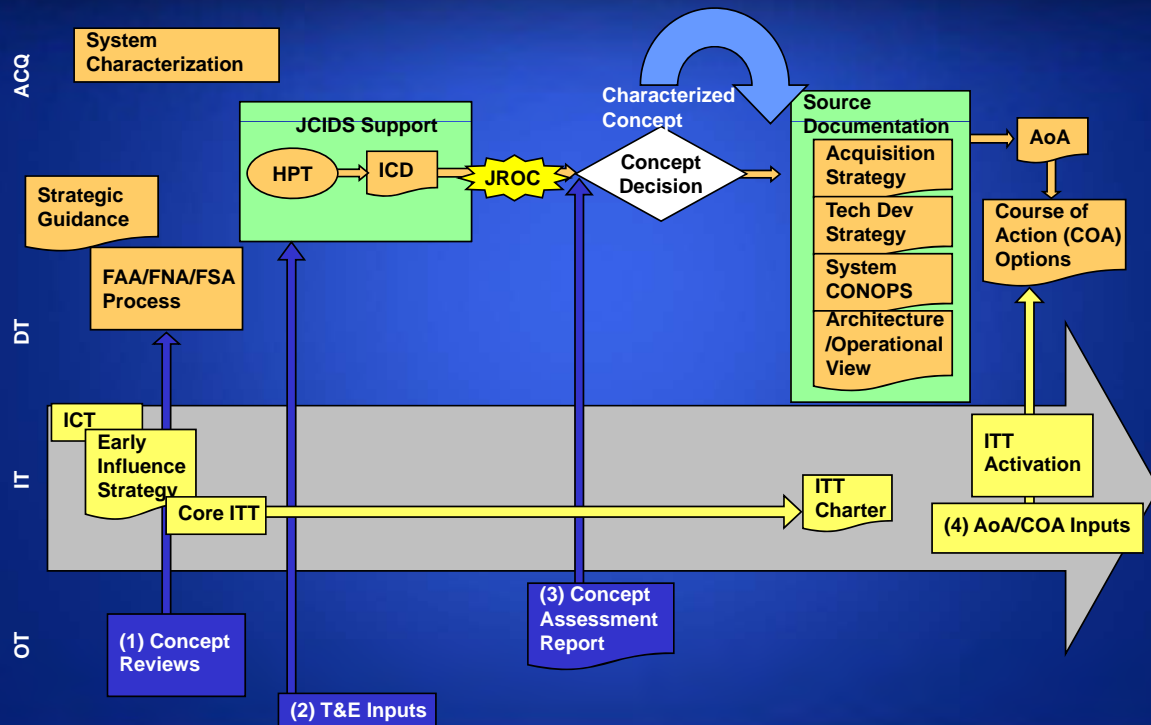
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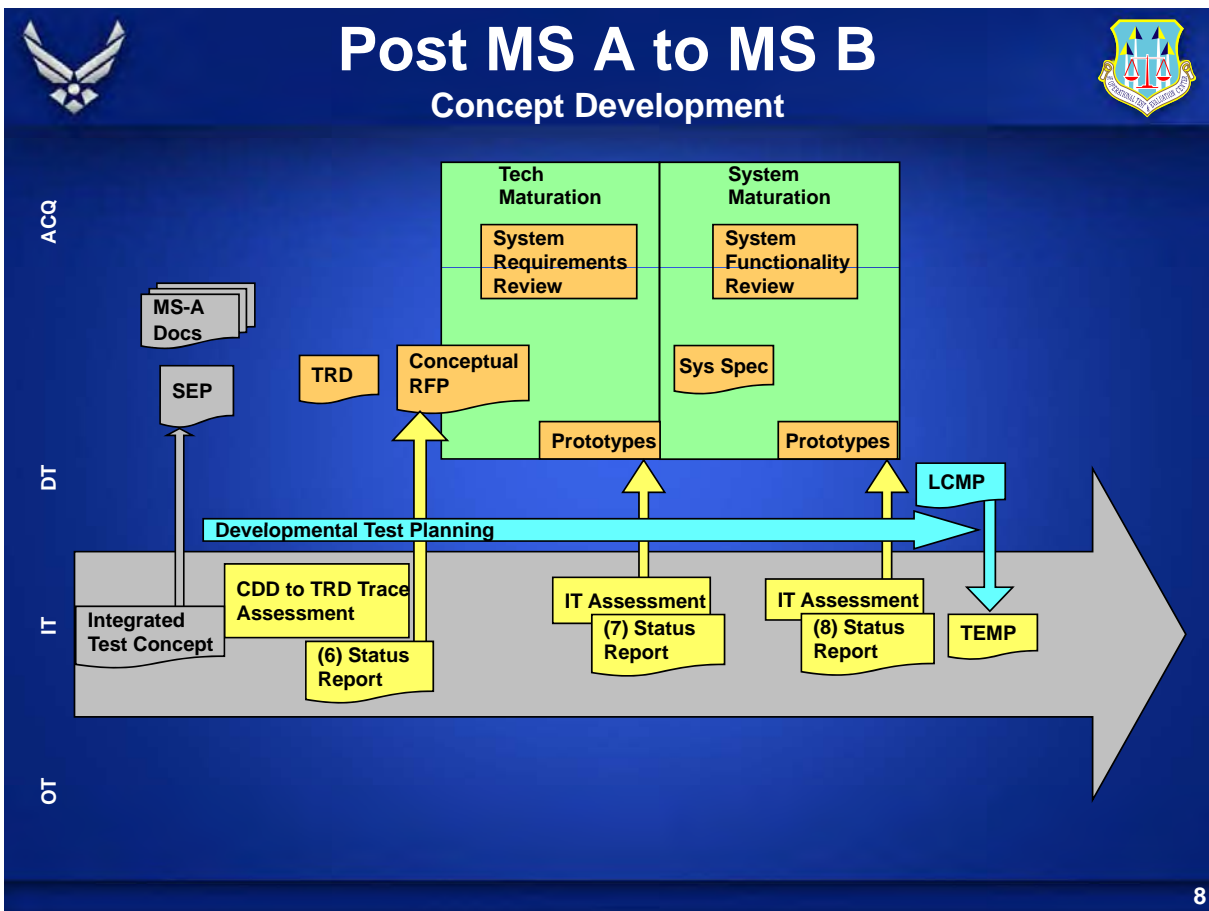
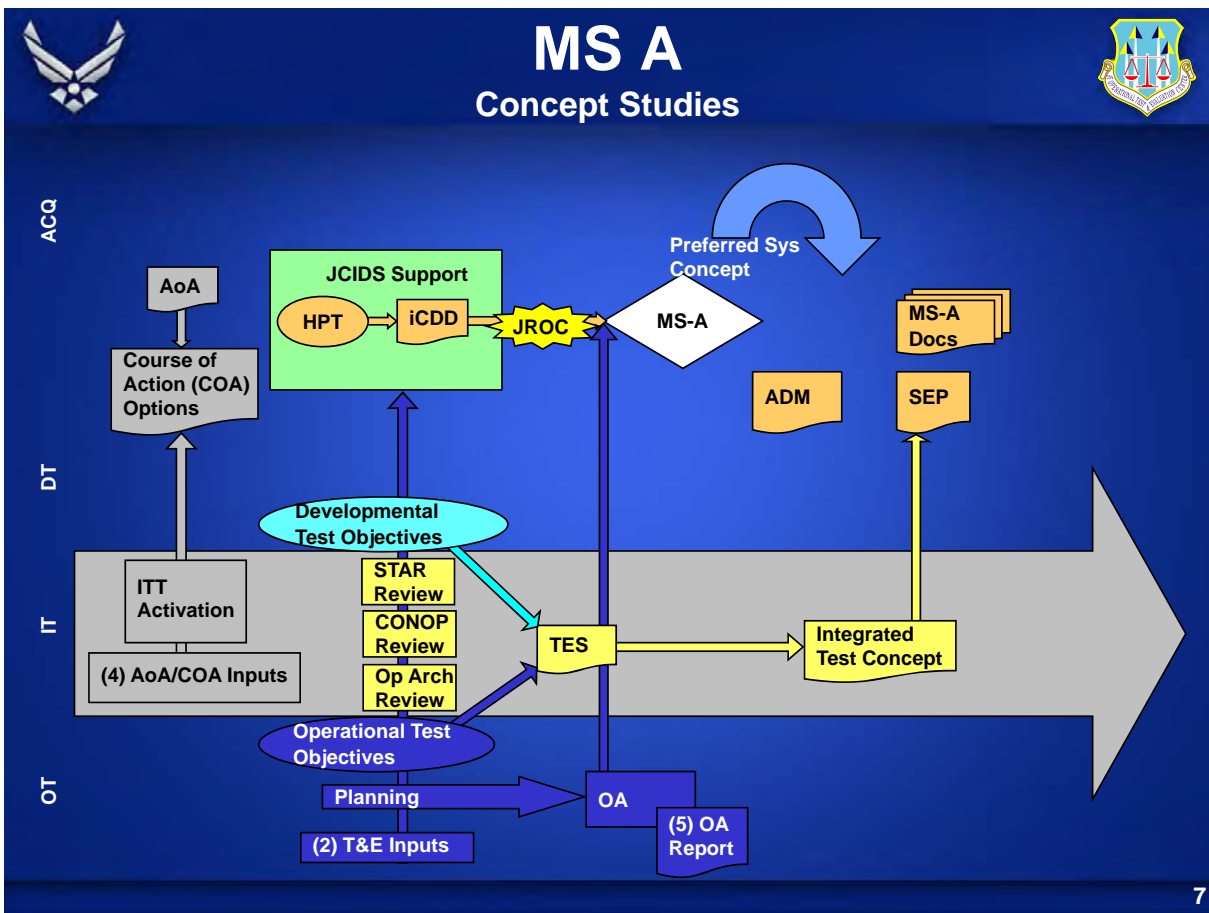


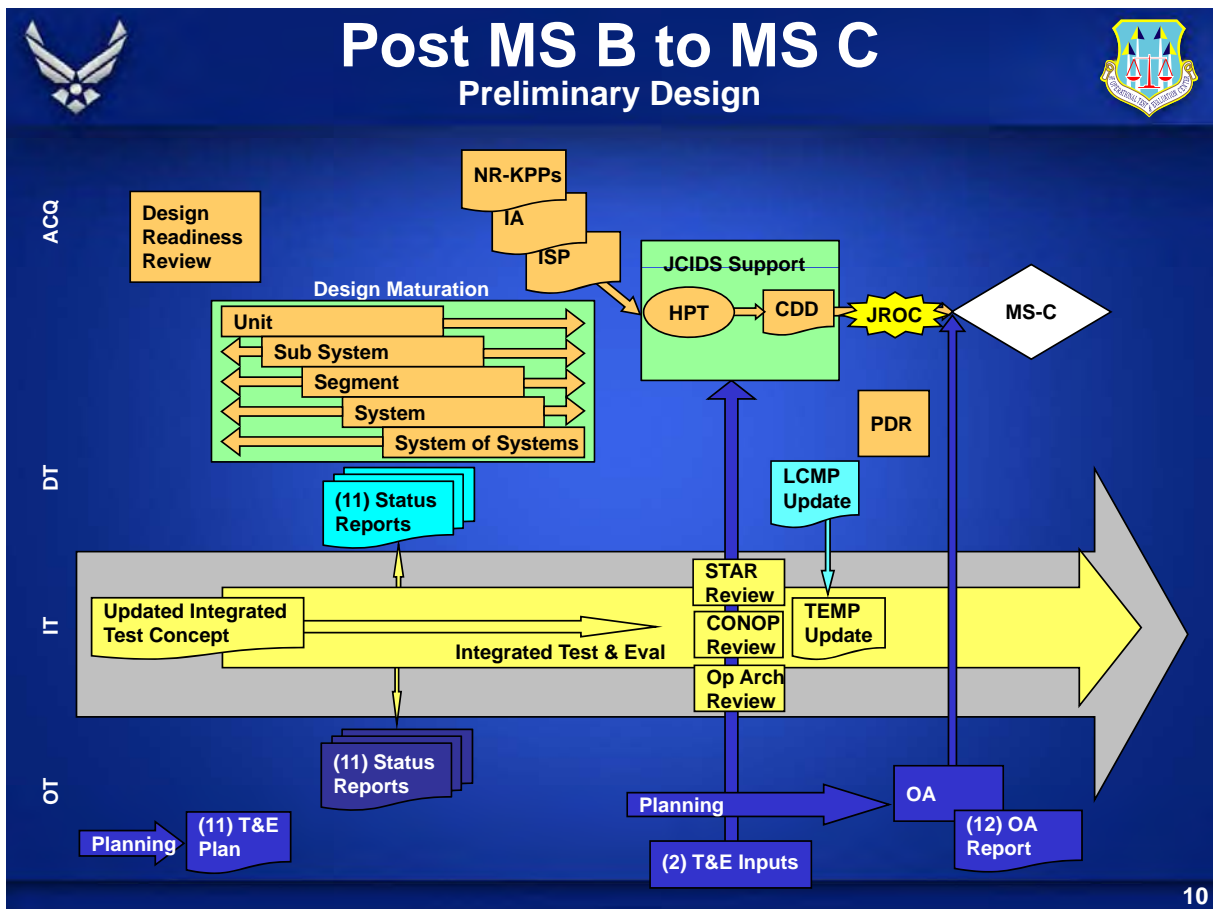
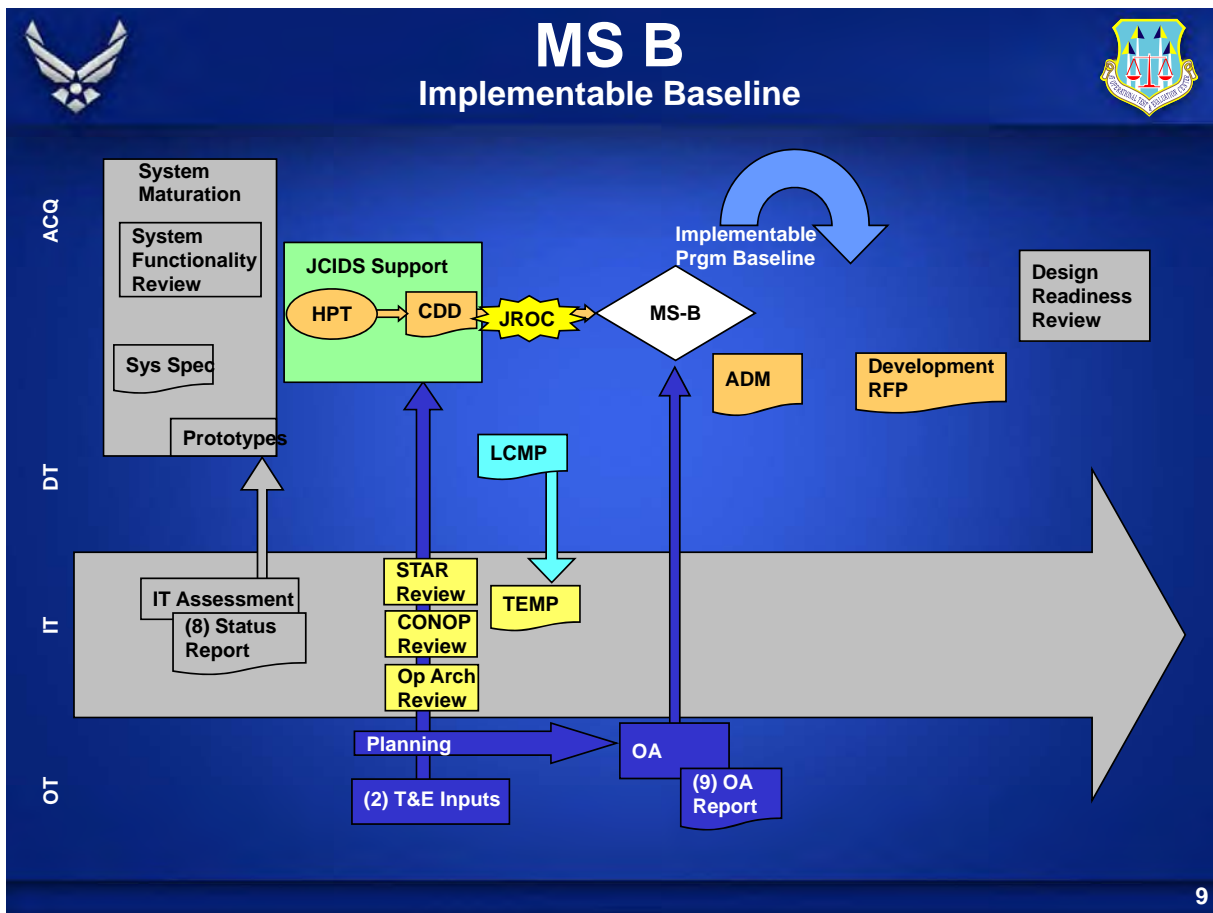
Pre-MS A Concept Studies

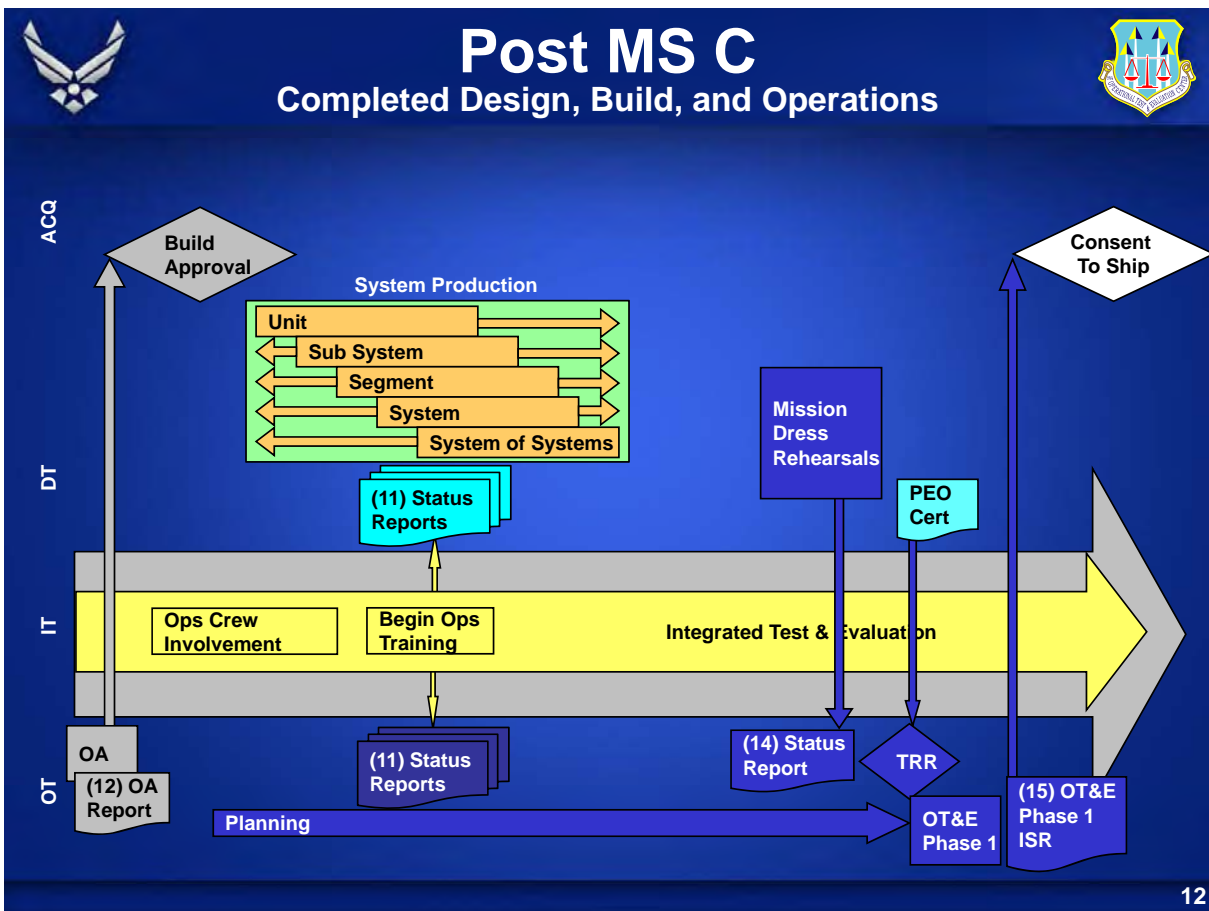
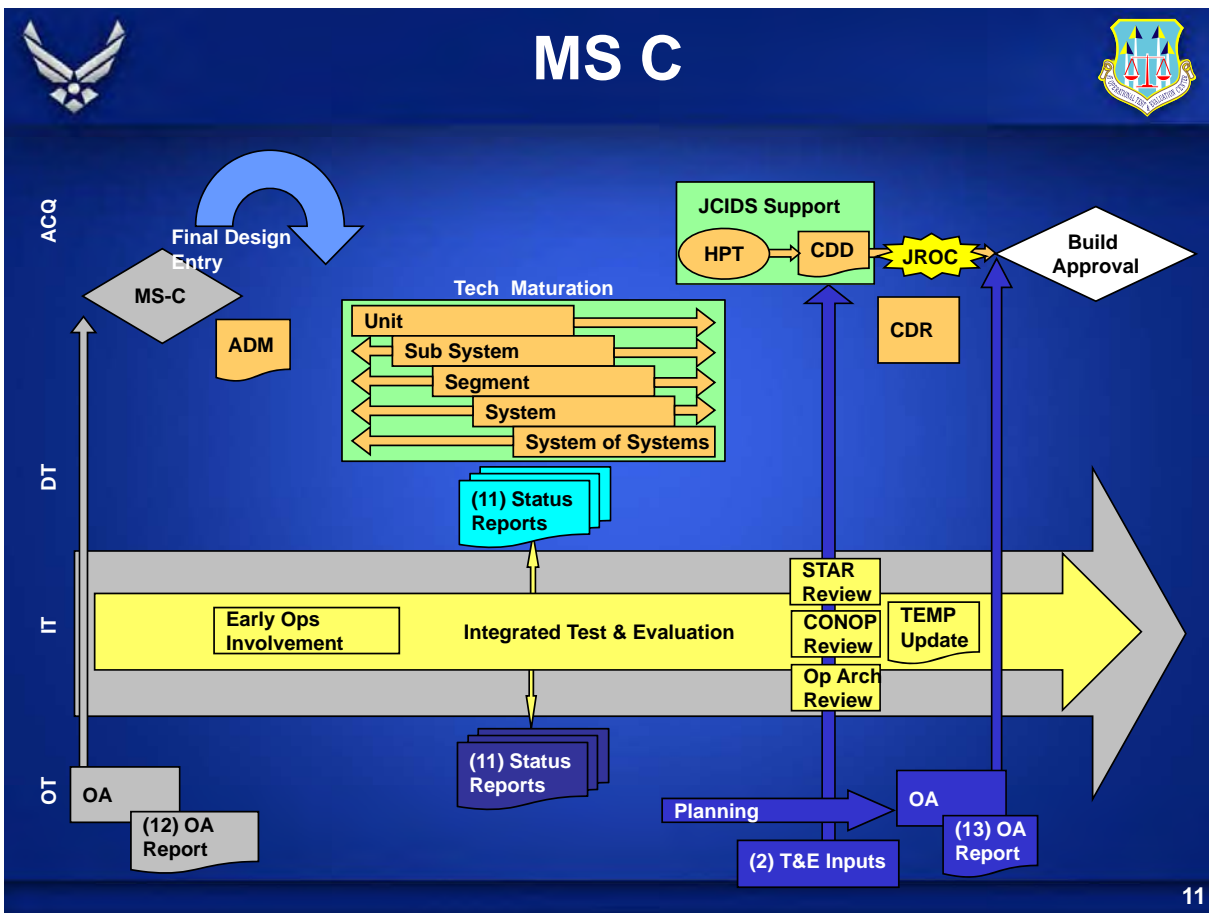


ICT – Integrated Concept Team

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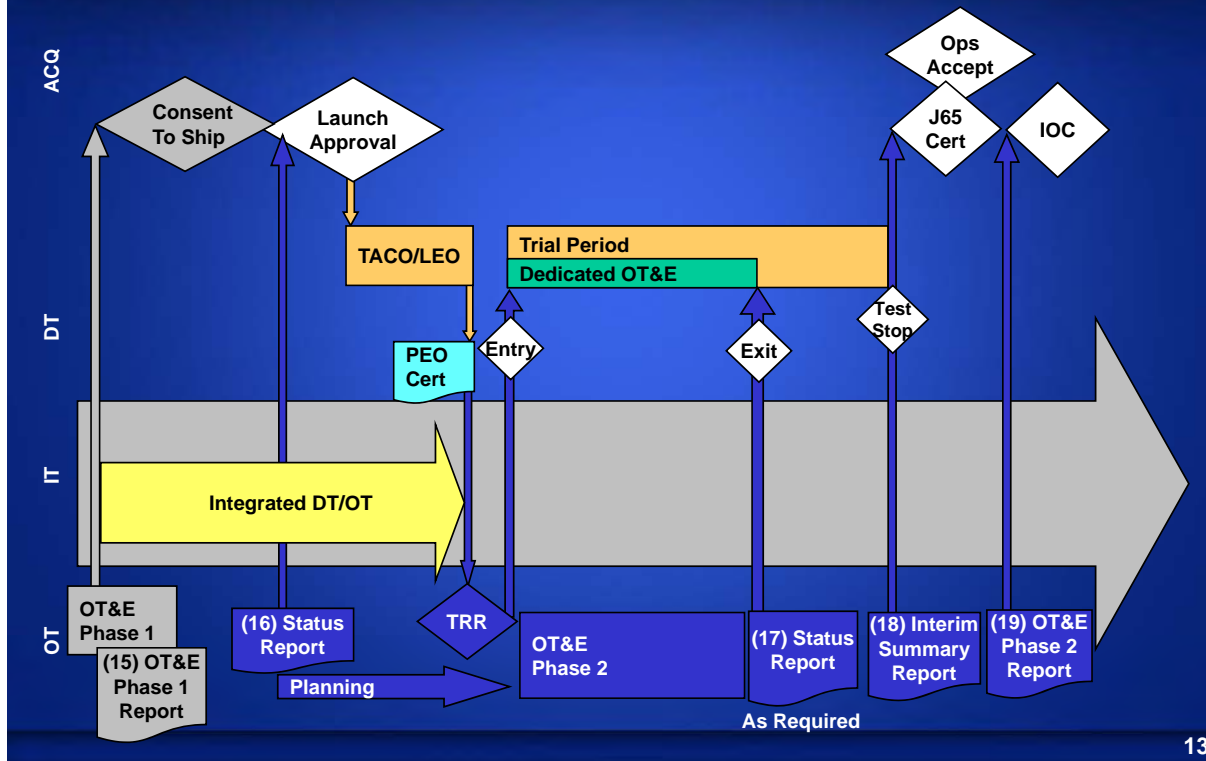




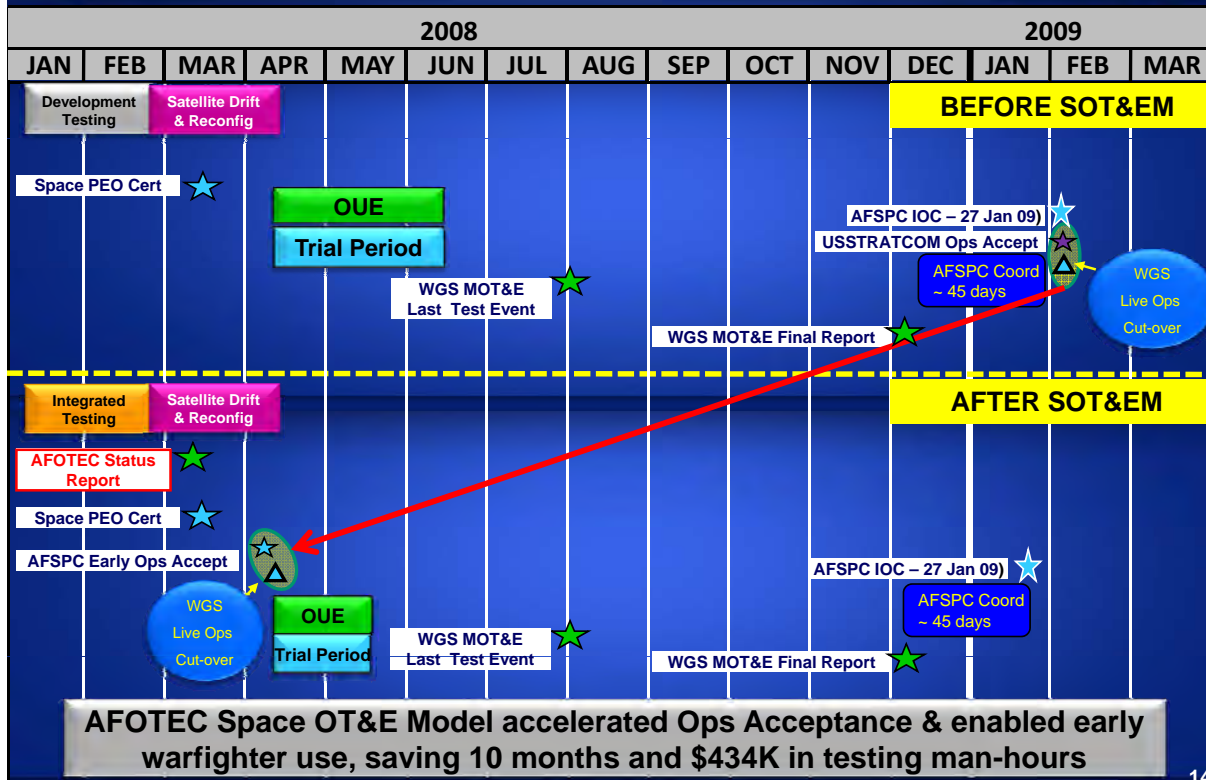




Post MS C Completed Design, Build, and Operations

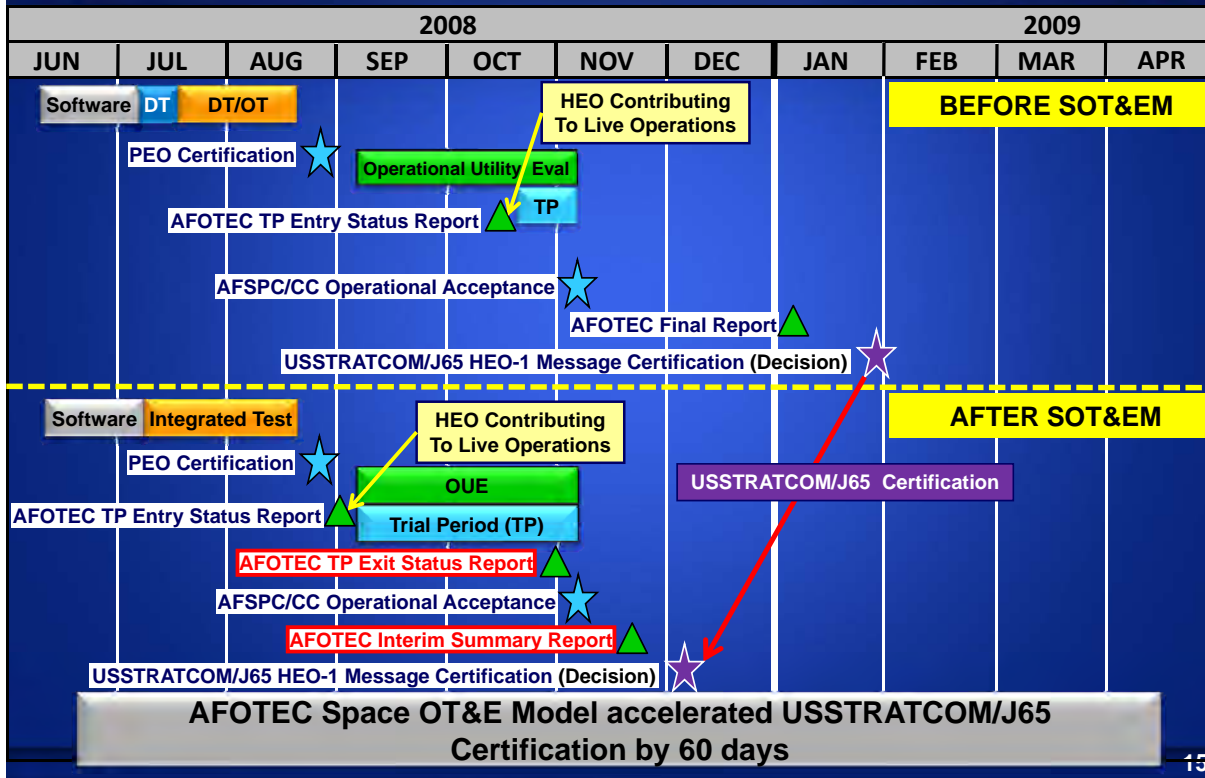


Wideband Global SATCOM

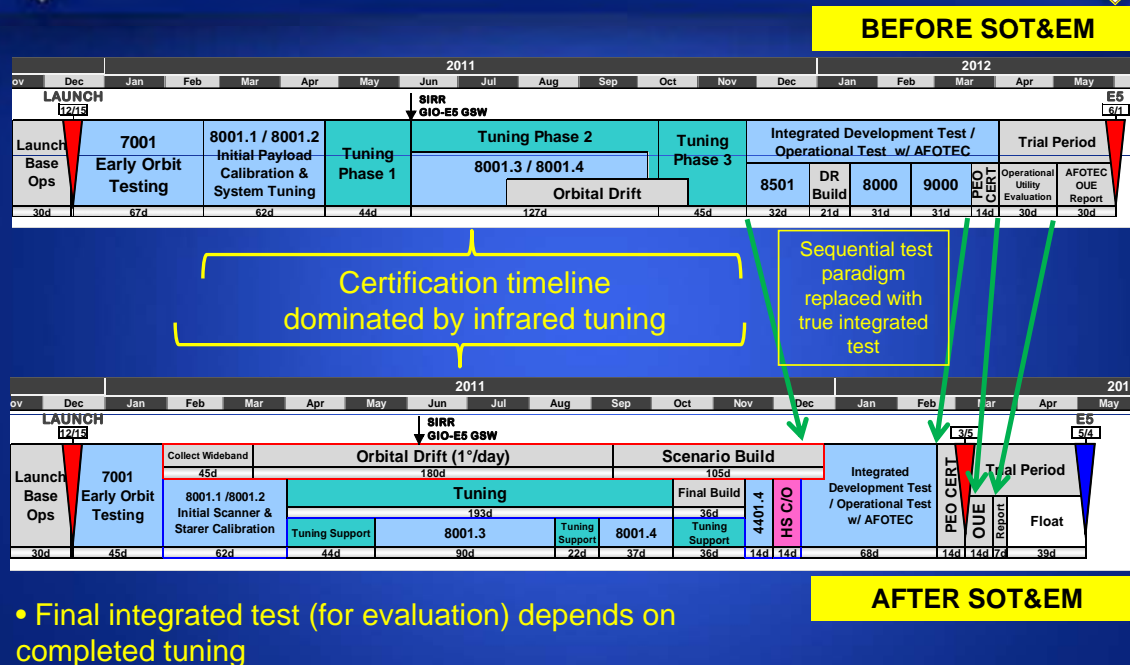




Space Based Infrared System (SBIRS) Highly Elliptical Orbit (HEO) 1



Space Based Infrared System (SBIRS) GEO-1 Certification





- 18



Global Positioning System



- **GPS Selective Availability and Anti-Spoof (SAASM) MOT&E**
 - Optimized IDT/OT agile reporting will enable high-confidence SAASM mission activation 9 months early
- **TEMP**
 - Reflects AFI 99-103, Chapter 8 Space OT&E Model

19



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21



Way Ahead



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22



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23



Summary



- The Space OT&E Model is now in line with space acquisition and paying dividends
- Space acquisition policy includes Space OT&E Model
- Institutionalizing the model
- AFOTEC is committed to collaboration with SMC to increase confidence in capabilities through IDT/OT

24



Questions?

Section 3

Improving AFOTEC's Contribution to the Acquisition Process: Moving Integrated Developmental and Operational Test to the Next Level

Maj. Gen. Stephen T. Sargeant

Air Force Operational Test and Evaluation Center Commander,
Kirtland Air Force Base, New Mexico

The Air Force Operational Test and Evaluation Center (AFOTEC) has aggressively moved forward over the last 12 months, institutionalizing early influence and is now influencing concepts, projects, and programs earlier than ever before. In addition, AFOTEC's Space Test Initiative (STI) has taken hold in space acquisition and is proving to better support the acquisition and operational decision makers for space systems. The STI is now the prescribed method for space operational test and evaluation (OT&E) and has transformed space test policy through collaboration between AFOTEC and the space community.

Most recently, we are working to address the processes to successfully execute integrated developmental and operational testing (IDT/OT) across all programs to take advantage of available efficiencies by sharing operationally relevant data and "buying down" dedicated OT&E time and asset costs when able. Finally, we have launched a new effort aimed at improving how we conduct OT&E for heavily software dependent capabilities. We have called our newest effort the Cyberspace Initiative.

Early influence: 1 year later

AFOTEC defines "early influence" OT&E activities as those occurring prior to milestone A or key decision point A, beginning with high performance teams (HPT). At these points in the acquisition timeline, there is a great opportunity to substantially influence capability requirements and acquisition strategies before they are approved by the *Air Force*

Requirements for Operational Capabilities Council (AFROCC).

Within AFOTEC, we moved leadership of early influence from an exclusively headquarters function to shared execution with the detachments. Program expertise and test execution reside in AFOTEC's detachments, and they now lead OT&E early influence in their respective focus areas with support from the headquarters. We also placed liaison officers (LNOs) in the Air Force Materiel Command product centers and the Pentagon to help identify early influence opportunities. The LNOs identify program managers for emerging programs as they are initiated and connect them with the appropriate test director in our detachments. We will complete our LNO manning by placing

personnel at the Air Armament Center at Eglin Air Force Base (AFB), Florida, and the Space and Missile Systems Center at Los Angeles AFB, California, in July 2009.

AFOTEC has an early and active role in the Air Force Requirements Policy and Process Division HPTs that develop the capability requirements documents used throughout the life of a program. In fact, we recently helped Air Force Materiel Command make HPT involvement by their developmental testers mandatory to better identify test capability challenges early in a program. AFOTEC also advocated for all Major Commands (MAJCOMs) to invite Air Education and Training Command personnel to all HPTs to facilitate consideration of training issues and capabilities as part of the requirements for all programs.

From Initial Capability Documents (ICD) forward, AFOTEC participates in requirements refinement.



Major General Stephen T. Sargeant, Commander

Using the Space Command and Control ICD review by the Integrated Test Team (ITT) as an example, AFOTEC identified 25 substantive comments during ICD preparation. As part of the ITT, our review helped refine requirements, ensuring they were testable, measureable, and operationally relevant. Several of the comments addressed parameters that limited design latitude with little operational foundation. Getting requirements documentation correct early improves the chances of successfully integrating developmental and operational testing to favorably affect the cost, schedule, and performance of a program by ensuring that realistic requirements are established and IDT/OT opportunities are identified. Additionally, early collaboration provides program office and developmental testers a look at the major factors affecting the “open book” test that operational testers will ultimately plan and execute.

In just the last 12 months, AFOTEC formally coordinated over 55 capability requirements documents. Of these documents, 38 were Joint Capabilities Documents (JCDs), ICDs, and capability development documents. JCDs are the earliest of these documents, developed prior to the functional solution analysis. JCDs are also written before experimentation or the selection of a material approach, before an acquisition category is assigned, and before Office of the Secretary of Defense, Director of Operational Test and Evaluation (DOT&E) oversight decisions are made. AFOTEC reviews these early capability documents for operational relevance, measurability, and testability.

We recently worked to ensure early OT&E influence is institutionalized in the Air Force and the Department of Defense (DoD) instructions and guidance. Specifically, we codified early influence concepts in DoD Instruction 5000.02, *Operation of the Defense Acquisition System*, and Air Force Instruction (AFI) 99-103, *Capabilities Based Test and Evaluation*. We are also ensuring that the guidance is contained in the Defense Acquisition Guidebook.

In the last year, AFOTEC executed 20 initial test design efforts using core teams with both internal and external participation. Core team representation includes users, program offices, developers, responsible test organizations, and DOT&E.

AFOTEC also exerts significant early influence in the form of early operational assessments (EOAs) of programs because they are planned and executed prior to milestone B or key decision point B. EOAs address capability and programmatic progress in terms of likely performance shortfalls, programmatic and documentation voids, and readiness for initial operational test and evaluation (IOT&E). EOAs provide invaluable insights to the using MAJCOM and the program office

to use in their trade-off decision process when changes are often less costly and more timely.

The Space Test Initiative

The AFOTEC-led STI is now space test policy. In July 2008, AFOTEC hosted the first Air Force Space Operational Test and Evaluation Summit at Kirtland AFB, New Mexico. Senior leaders from AFOTEC, Under Secretary of the Air Force Directorate of Space Acquisition, National Geospatial and Intelligence Agency, Air Force Space Command (AFSPC), Space and Missile Systems Center, and the Air Force Research Laboratory gathered to discuss STI and focused on creating a new space testing model for OT&E. The summit participants moved away from a process that resembled “standardization and evaluation” after launch or fielding, to a process of early and continuous involvement throughout the development and fielding of a new space-enabled capability. The three key elements of STI are early and continuous involvement and integrated testing, agile analysis and reporting, and system-of-systems evaluation.

Our new space OT&E model is endorsed well beyond the Air Force and provides a space system testing process tailored to the space acquisition model. Importantly, our space OT&E model now provides decision quality data to the space acquisition and operational decision-makers in a timely and accurate manner.

When AFOTEC's Detachment 4 at Peterson AFB, Colorado, tested the Space-Based Infrared System (SBIRS) Highly Elliptical Orbit payload (HEO-1) and operations center, they combined IDT/OT with agile reporting to accelerate HEO-1 operations by 6 weeks. The key enabler reducing time and cost for the Operational Utility Evaluation (OUE) was Detachment 4's leveraging of Lockheed Martin's planned developmental testing period to also achieve operational testing objectives. Detachment 4 also leveraged system trial period operations to further execute and report on the OT&E. Using agile reporting, AFOTEC informed the AFSPC HEO-1 operational acceptance decision and further enabled a U.S. Strategic Command system certification 8 weeks early (*Figure 1*). AFOTEC is preparing to test a second HEO payload simply known as HEO-2. Although the HEO-2 program had not originally planned to conduct operational testing early in the program, AFSPC is capitalizing on the HEO-1 momentum created by AFOTEC's new space OT&E model and is accelerating HEO-2 transition into the SBIRS constellation. Subsequent operational testing and reporting will further accelerate HEO architecture operational acceptance and employment of warfighting capabilities.

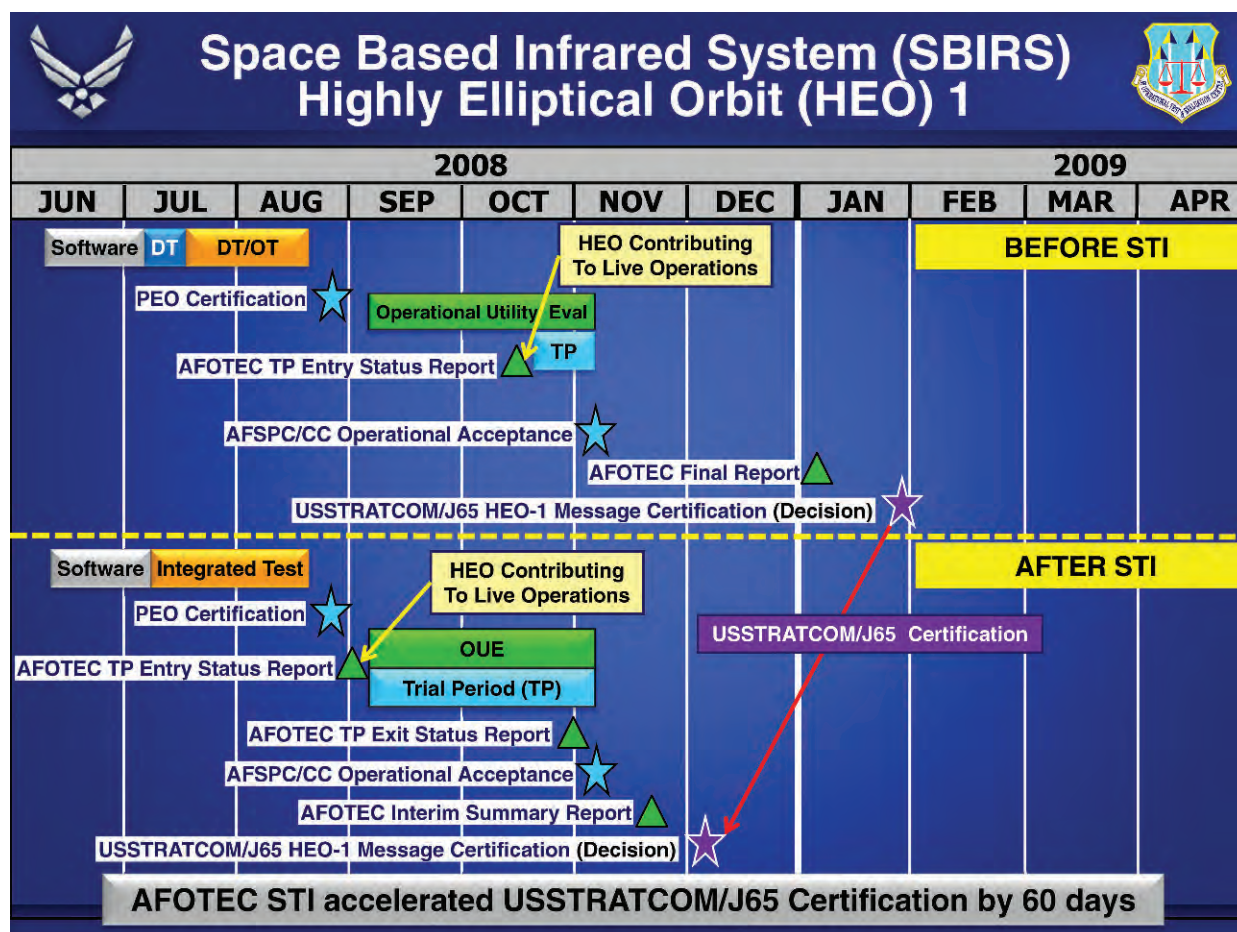


Figure 1. SBIRS space test initiative example.

AFOTEC drafted the new Chapter 8 for AFI 99-103, *Capabilities Based Test and Evaluation*, to reflect the new space OT&E model. Furthermore, AFOTEC hosted a meeting in December 2008 to draft an annex to National Security Space Acquisition Policy 03-01 (NSS 03-01), incorporating the space OT&E model and aligning NSS 03-01 with AFI 99-103. With the cancellation of NSS 03-01, the information in the draft annex will be proposed as an appendix to DoD Instruction 5000.02.

Overall, the new space OT&E model enables better space warfighting capability acquisition through early and continuous integrated testing to ensure that systems address mission capability gaps, and enables early user and program office trade-off decisions when changes are less costly and more timely.

Integrating DT and OT

The test community can often positively affect a program's cost-schedule-performance problems by making better use of limited resources to eliminate unnecessary duplication of test events, better assure systems are ready for operational testing, and reduce the

overall time required for dedicated operational testing. Integration of developmental testing and operational testing improves efficiency and, in many cases, allows us to reduce the cost of dedicated OT&E. Early influence is essential to successful IDT/OT for all programs.

The Air Force is leading the way in IDT/OT planning through participation in HPTs and ITTs. Working with the DT community provides early access to data critical to our operational assessments. Our participation in the HPTs and ITTs is the key to setting the conditions for the most effective IDT/OT. The AFOTEC and program office leaders cochair the ITT and therefore, can ensure the access to data.

At AFOTEC, we are making IDT/OT a requirement for all programs. Successful IDT/OT needs three things: early and continuous collaboration between the warfighter (user), acquisition, and T&E communities; OT&E plans informed by DT execution; and acknowledgment by the Program Element Officer (PEO) and appropriate DT wing commander of the dependency of the OT&E plan on planned DT execution.

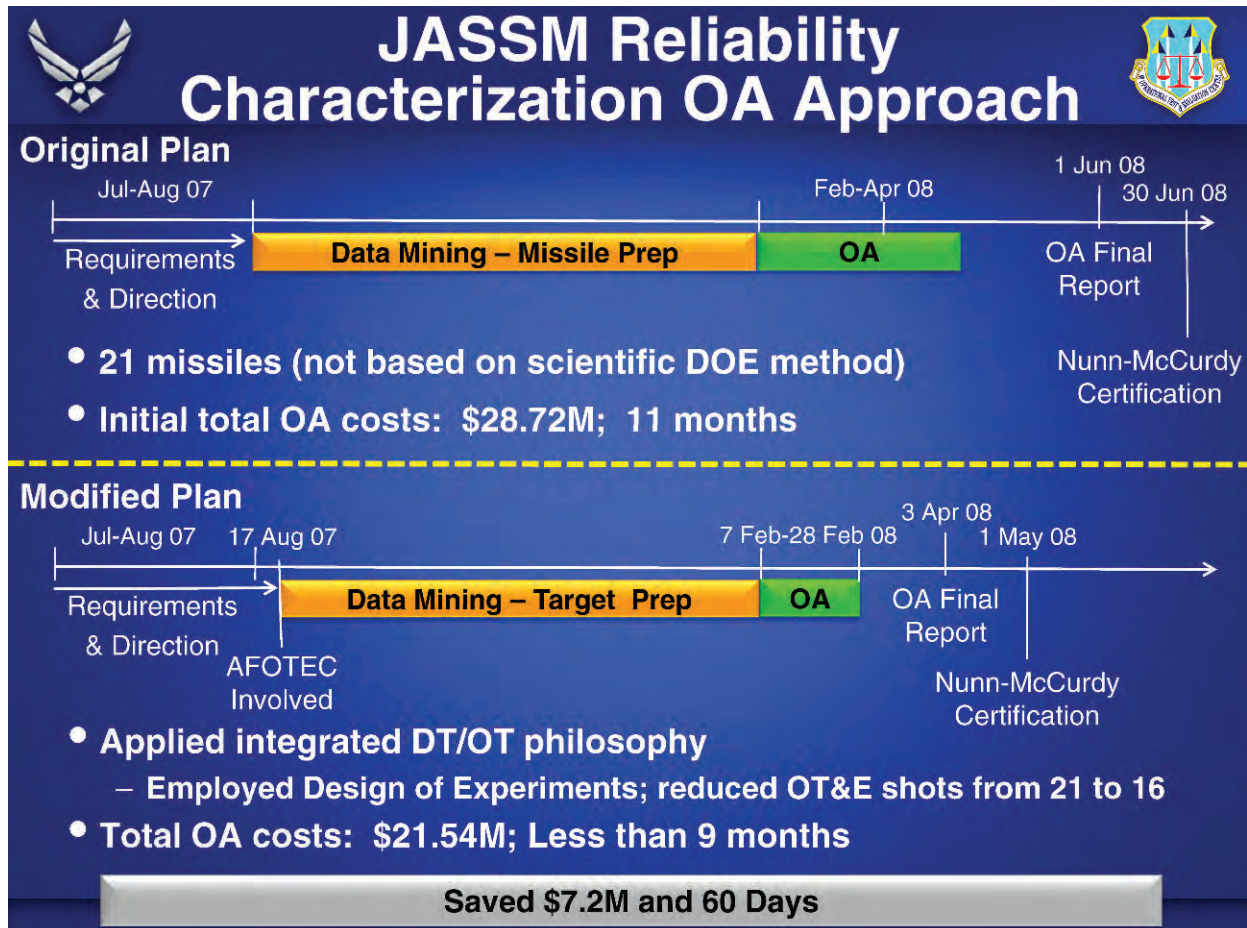


Figure 2. Joint air-to-surface standoff missile integrated DT/OT example.

Integration is where we are going in acquisition and test. It makes sense to use operationally relevant data generated by the developer and the developmental tester to “buy down” OT&E where able. Successful integration requires identifying data requirements for OT&E and providing access to the data in program contracts. Operational testers are now involved in the request for proposal (RFP) development process to help developers understand data sharing requirements early on.

By employing IDT/OT, the operational testers assume greater risk than in the past. Rather than waiting for the PEO to certify a program’s readiness for IOT&E, we now build our plans earlier and work to define the point at which DT systems are “production representative.” We also help identify when to put the system into more operationally realistic scenarios so we can gather operationally relevant data early, allowing us to “buy down” dedicated OT&E in terms of cost and time.

After we have scoured the DT plans to find areas of overlap and duplication, we will build an OT&E plan

that accounts for the operationally relevant DT data. We then send our OT&E plan to the PEO and DT wing commander for acknowledgment that our plan depends on DT execution as planned and the resultant data.

IDT/OT was one of the focus areas of the February 2009 Air Force Test and Evaluation Days we hosted in Albuquerque, New Mexico. The conference panels generated a great deal of discussion on the subject, and the conference working groups further developed their ideas to produce a draft white paper entitled: *Prescribed Process for Integrated DT/OT*. The processes developed in the white paper will also support our work with the entire test community to amend the range of DoD and U.S. Air Force instructions that will enable better integrated test and evaluation.

Early integrated DT/OT success stories

Though work remains to be done to further refine the processes enabling more effective IDT/OT, we demonstrated notable successes in our application of IDT/OT. The following examples illustrate some of

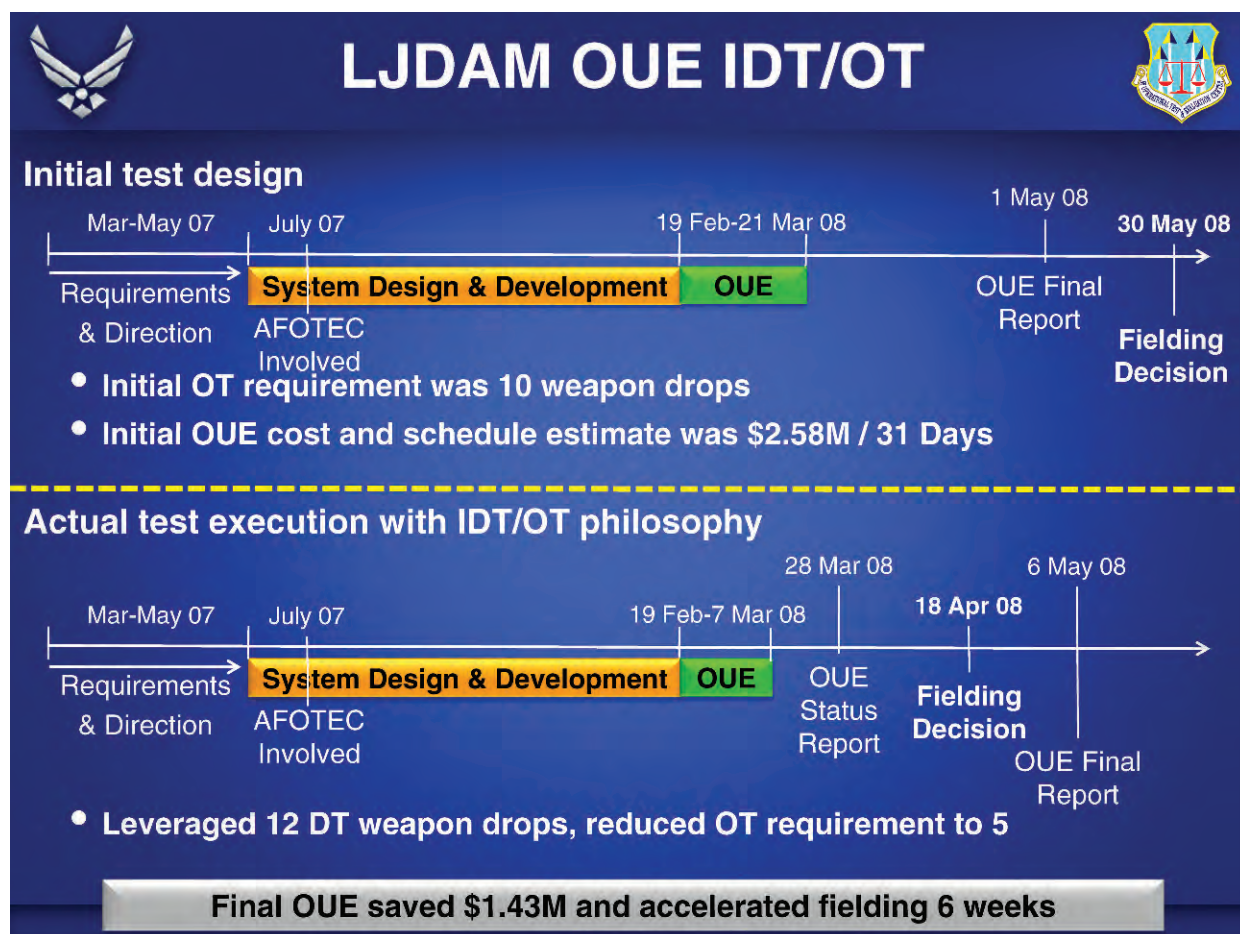


Figure 3. Laser JDAM example.

the efficiencies gained by working closely with the user, developer, and developmental testers. Early efforts ultimately reduce acquisition risk and accelerate warfighting capabilities to the warfighters.

The first example involves AFOTEC's Detachment 2 at Eglin AFB, Florida. AFOTEC testers worked with the system program office and developer on the Joint Air to Surface Stand-Off Missile reliability characterization operational assessment (OA) (Figure 2). The Undersecretary of Defense (Acquisition, Technology and Logistics) directed the Air Force to conduct a reliability characterization program prior to Nunn-McCurdy certification hearings as a result of several weapon failures during the April 2007 Weapon System Evaluation Program.

The original plan was not based on scientific design of experiments (DOE) methods and called for 21 missiles at a cost of more than \$28 million and required 11 months to complete. We then applied DOE and used the data from several DT delivered weapons under our IDT/OT approach and reduced the number of dedicated OT&E weapons to 16. The IDT/OT

plan reduced the OA costs to approximately \$21.5 million and took less than 9 months to complete. IDT/OT and the use of DOE allowed us to save more than \$7 million and informed the Nunn-McCurdy certification hearing 60 days earlier than originally planned.

Another successful IDT/OT event also involved AFOTEC Detachment 2 testers working with the DT community in a successful Laser Joint Direct Attack Munition (JDAM) Operational Utility Evaluation (OUE) (Figure 3).

The Air Combat Command (ACC) asked AFOTEC to conduct an OUE on the Laser JDAM, an urgent operational need program addressing the capability to engage moving targets with JDAM. The initial test plan was based on DOE and required 31 days and 10 weapons to execute an adequate evaluation. We then applied an IDT/OT approach and leveraged 12 production representative DT weapons employment events. AFOTEC testers were able to augment and complement data from the DT drops using only five dedicated OT&E weapons. The impact of the approach resulted in a savings of five Laser

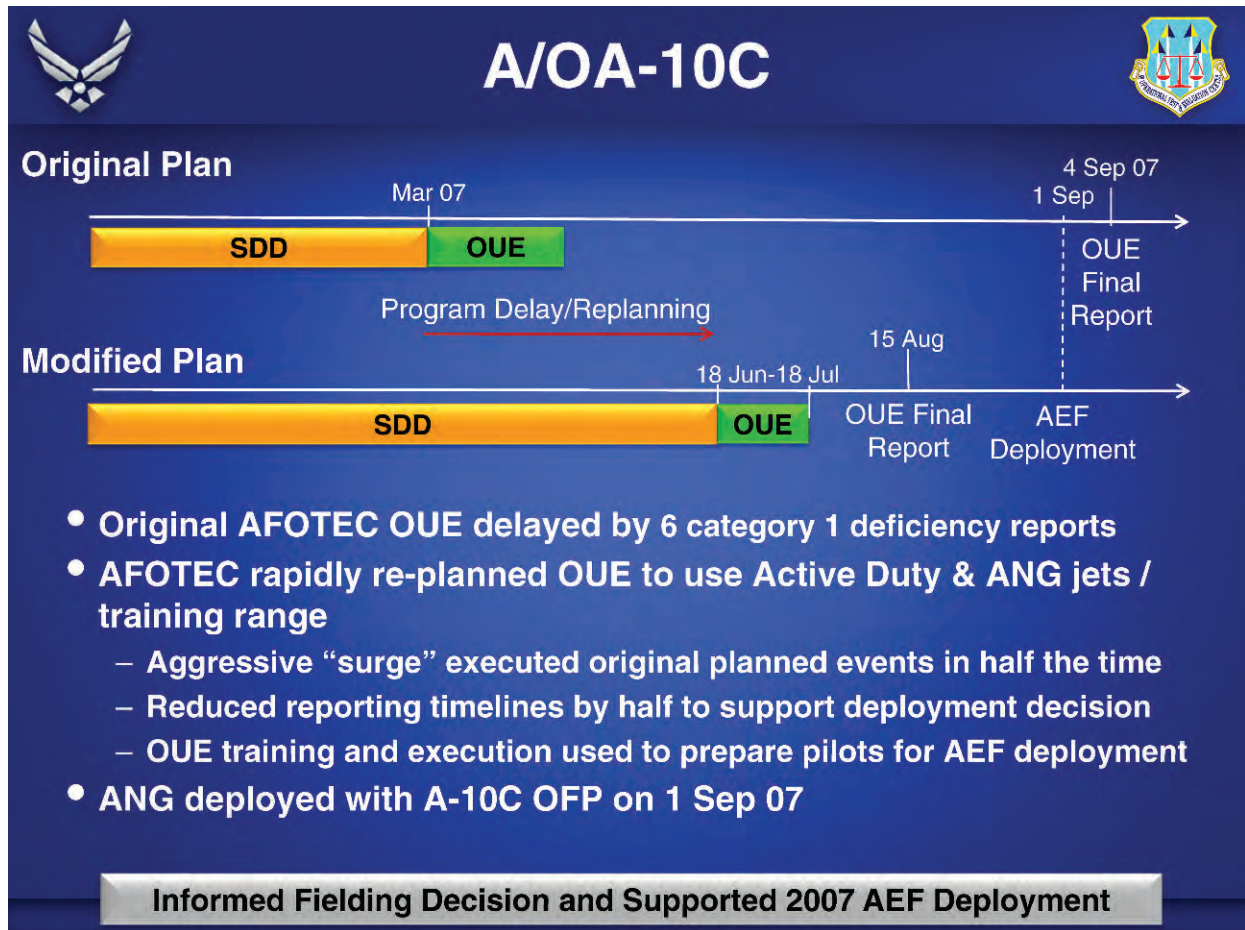


Figure 4. A/OA-10C example.

JDAMs valued at nearly \$300,000 each or \$1.43 million, as well as completing the OUE 14 days ahead of schedule. The accelerated reporting provided early, relevant information to the ACC decision maker and enabled an April 18, 2008, fielding decision. By May 2008, the weapons were being loaded on 332nd Air Expeditionary Wing aircraft at Joint Base Balad, Iraq. Airmen from the 77th Expeditionary Fighter Squadron, flying F-16 Fighting Falcons, successfully employed the first Laser JDAM August 12, 2008, against a moving enemy vehicle in the Diyala province in support of a Combined Iraqi army and U.S. Marine Corps operation.

“This first employment represents a great step in our Air Force’s ability to deliver precise effects across the spectrum of combat,” said Lt. Gen. Gary L. North, the U.S. Air Forces Central commander and U.S. Central Commands Combined Force Air Component commander in an August 2008 interview with Deagel.com. “The first combat employment of this weapon is the validation of the exacting hard work of an entire team of professionals who developed, tested and fielded this weapon on an extremely short timeline, based on an urgent needs request

we established in the combat zone.” The total time from concept to employment was only 17 months.

Another successful IDT/OT event was the A/OA-10C OUE conducted by AFOTEC’s Detachment 6 at Nellis AFB, Nevada. The original plan was to complete the OUE in March 2007 using jets from Davis-Monthan AFB, Arizona, and the Goldwater Range. However, during DT/OT, AFOTEC, ACC, and the System Program Office determined that, with six Category 1 Deficiency Reports, the Operational Flight Program was not ready for the OUE.

AFOTEC stayed engaged and committed to making the original August 1, 2007, fielding decision and subsequent September 2007 Air Expeditionary Force deployment by using a variety of IDT/OT data sharing techniques. AFOTEC’s Detachment 6 testers replanned the OUE to use Nellis active duty and Maryland Air National Guard crews and jets on the Nevada Test and Training Range during the June to July 2007 timeframe. The Maryland ANG also used the spin up for the OUE to train and prepare for their September 2007 deployment (Figure 4).

AFOTEC executed an extremely aggressive test schedule and report process. On August 1, 2007, the ACC commander decided to field the A/OA-10C, and the stage was set for the Maryland ANG to deploy on schedule. The Maryland ANG was the first unit to deploy with the A-10C and engage in combat operations. The first JDAM employed from the A-10C resulted in a direct hit on an insurgent safe house in Iraq.

Way ahead

As we developed the STI, we saw many similarities in the test and evaluation of cyberspace systems where we often conducted OT&E after fielding, providing limited value to acquisition decision makers for software intensive systems. To improve test and evaluation for cyberspace systems, we will stand down our Kirtland-based Detachment 3 and combine our cyberspace system expertise with Detachment 4 (space) and Detachment 2 (command, control, and communications systems).

AFOTEC will lead a cyberspace test working group and a summit to apply the same level of rigor to cyberspace OT&E as we did to space. Our goal is to produce a cyberspace OT&E model that better aligns with the acquisition strategies for these systems. Our cyberspace efforts are directly in line with the Air Force's current integration of cyber and space.

Summary

AFOTEC demonstrated the value of the new space OT&E model, early influence, and IDT/OT over the past year. Most importantly, we successfully codified and institutionalized early influence and IDT/OT as well as our new space OT&E model across the U.S. Air Force and DoD.

New levels of communication and coordination are enabling IDT/OT and resulting in significant cost and time savings for programs. Early and continuous communication between all players on the acquisition team, including the program office, the developer, the user, and the OT&E organization is the key to success. □

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FROM EARLY INFLUENCE TO DEDICATED OT&E: A NEW MODEL FOR OPTIMIZING SPACE SYSTEM T&E

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ABSTRACT

The warfighter requires space system operational test to be as cost effective and as operationally realistic as possible. While the operational battlespace can be used for testing some systems, waiting to accomplish initial operational test and evaluation of a new space system until it is delivered in space is fraught with many pitfalls. Conversely, the overly controlled environments used during developmental test and evaluation do not possess enough operational realism to fully evaluate a system's operational capability. The Air Force Operational Test and Evaluation Center (AFOTEC) developed the Space Operational Test & Evaluation Model (SOTEM) to address early operational test influence and integrated developmental test/operational test (IDT/OT) in the space development process. SOTEM is codified in Air Force instructions, and details the involvement of all stakeholders throughout the Department of Defense (DoD) space system acquisition process. AFOTEC is realizing benefits from SOTEM and gaining lessons learned during testing of the Space-Based Infrared System and Wideband Global Satellite Communications. In order to fully implement SOTEM, AFOTEC requires DoD and industry partnership to accomplish fully integrated end-to-end, system-of-systems testing of space systems before ship and/or launch in as operationally realistic an environment as possible.

KEYWORDS: space, operational, test, OT&E, model, AFOTEC, SOTEM, SBIRS, WGS.

INTRODUCTION

Until recently, there were disconnects between the Department of Defense (DoD) acquisition and the operational test and evaluation (OT&E) policies. The DoD had one acquisition process for producing space and missile systems, "National Security Space Acquisition Policy, Number 03-01," (DoD 2004) known commonly as NSS 03-01, and another for non-space acquisitions, "Operation of the Defense Acquisition System" (DoD 2008) in the DoD 5000 series of publications. While each used similar language, there were differences in the timelines and expectations associated with the phases of acquisition.

With space system acquisitions, more costs are incurred and time spent early in development to design complex space capabilities, order specialized components and subassemblies, conduct unit and integration testing, synchronize the development with the required ground systems, and assemble all components into a final product that is ready for launch.

Because of the higher cost early in the lifecycle of a space acquisition, more detailed design decisions were required earlier in the process. The NSS 03-01 acquisition process also forced a distinctive approach to the operational testing of space systems. Prior to July 2008, approximately 90 percent of an operational test (OT) effort occurred after a space system was launched into orbit, so any deficiencies discovered during operational testing were not easily correctable, if at all. The disparity between the time design decisions were made and the time operational testing could discover flaws severely decreased the relevance of space operational testing.

However, the Air Force Operational Test and Evaluation Center (AFOTEC) recognized the space acquisition process needed OT input during the early design decisions to avoid discovering operational deficiencies after millions or billions of dollars had been invested in a new system, and when many of these deficiencies could no longer be resolved. Major General Stephen T. Sargeant, AFOTEC Commander, Colonel Suzanne M. Beers, PhD, AFOTEC Detachment 4 Commander, and their staffs formulated a new approach to operational testing of DoD space systems.

In July 2008, AFOTEC hosted a Space Summit at Kirtland Air Force Base during which the major topic of discussion was this new approach, initially called the Space Test Initiative. Following the Summit, Major General Sargeant said, “We need to provide a better way to conduct space operational test and evaluation in order to provide better decision quality data to the space acquisition and operational decision-makers.” (Gandara 2008)

The representatives attending the Space Summit discussed and came to agreement on the following new tenets of a transformed model and timeline for Space OT&E:

- Maximize early influence opportunities
- Integrated developmental test/operational test (IDT/OT) throughout acquisition cycle
- Agile analysis and reporting
- System-of-systems evaluations

By the end of August 2008, AFOTEC refined this new model with key inputs from all areas of DoD space acquisition and space system development corporations. Maj Gen Sargeant and Col Beers published the Space Test Initiative and the new Space OT&E Model (SOTEM) in The International Test and Evaluation Association (ITEA) Journal of Test and Evaluation in December 2008 (Sargeant and Beers 2008). SOTEM, in the words of Maj Gen Sargeant, rapidly moves us “away from a process that looks like “Stan-Eval” after launch or fielding, to early and continuous improvement throughout the development and fielding of a new space capability.” (Gandara 2008)

THE SPACE OT&E MODEL

What is SOTEM? It is a set of events organized along the space acquisition timeline that enacts the Space Test Initiative tenets and maximizes the participation and influence of operational testers before space system orbital launch. The following sections cover these events in the new Space Interim Guidance timeline (Figure 1); the Space Interim Guidance replaced NSS 03-01.

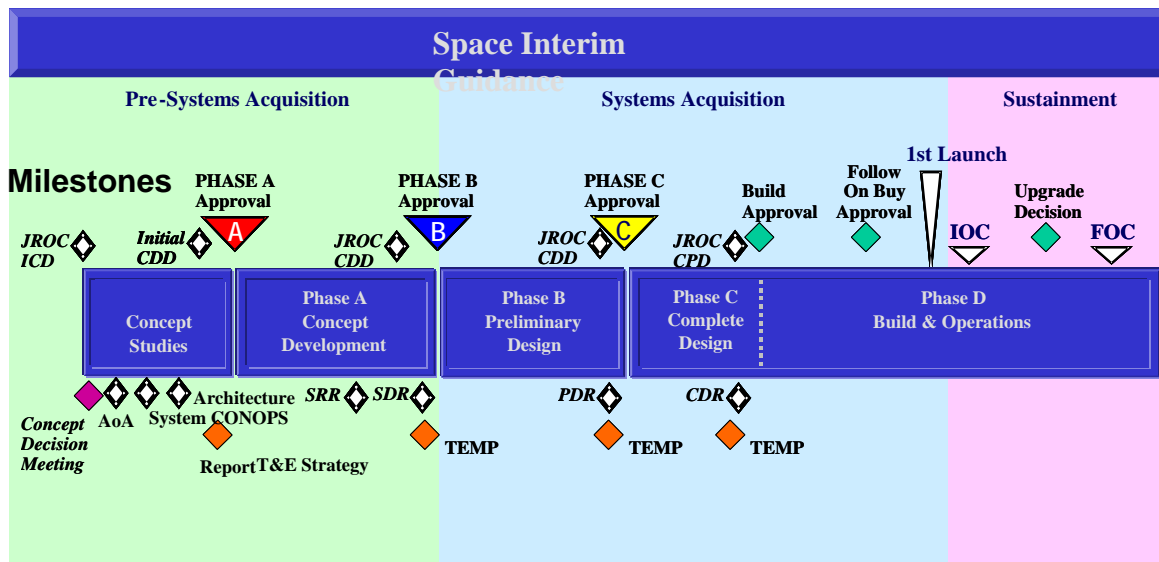


Figure 1. Space Interim Guidance Timeline

To maximize early influence opportunities, operational testers need to be involved during requirements development, starting as far back as participation on High Performance Teams (HPTs) that establish needed capabilities in an Initial Capabilities Document (ICD), during the Analysis of Alternatives (AoAs) and Materiel Development Decision (MDD), and in the development of Concept of Operations (CONOPS). DT and OT personnel involved early require training on how to participate on HPTs, in AoA and MDD selection, and in CONOPS development. Additionally, a program Integrated Test Team (ITT) must be chartered and begin meetings immediately following the MDD to begin the program and technology research that leads to drafting the initial T&E Strategy. An ITT is composed of all pertinent stakeholders involved in testing a system, including the development contractor, the government DT test team, the OT test team, and the warfighter/user among others. Early ITT meetings and research will ensure the System Program Office (SPO) adequately addresses operational test needs during the early design process.

Between Milestones A and B, operational testers will conduct one or more Early Operational Assessments (EOAs) on prototypes and the preliminary design to evaluate potential operational effectiveness, suitability, the degree to which they will meet the operational mission need, and to highlight any other operational issues. At least one EOA will be required to inform the Milestone B decision with an operationally-focused evaluation of the system concept.

From Milestone B to C, the OT organization provides status reports to the SPO on progress toward operational effectiveness and suitability, the degree to which the system is making progress toward meeting the operational mission need, and any other noted operational issues.

These status reports begin to form an assessment of the system-of-system and the interfaces required for the system to operate successfully within its operational architecture. The OT organization will conduct an OA to aggregate the information gathered through the preliminary design review phase to inform the Milestone C, Final Design Entry, decision.

During the Complete Design phase (phase C) of development between Milestones C and Build Approval, the ITT community will be involved in all testing activities. At the conclusion of the Critical Design Review, the OT organization will produce one or more OA reports providing updated information on the potential operational effectiveness, suitability, and degree to which the proposed design is making progress toward meeting the operational mission need.

After Build Approval, the OT organization will take full advantage of planned DT events by injecting OT test measures and scenarios to gather information to fulfill OT&E test objectives. The system production period, a subset of the build and operations phase (phase D), will culminate in a pre-shipment OT&E phase, which will put a system in as near an operational environment as can be replicated on the ground to allow OT&E to inform the Consent to Ship decision. After deciding to ship a satellite from the manufacturing facility, the system will be moved to a launch range, mated with a booster, and final integration and communication testing will occur. Again, integrated testing will inject OT test measures and scenarios into the DT-centric check-out events to provide an operational look into any technical issues identified during compatibility testing. An integrated testing status report will inform the “go/no-go” Consent to Launch decision.

After launch and during early orbit operations test and check-out, the OT organization will inject operationally realistic scenarios, backgrounds, and procedures to the greatest extent possible. At the conclusion of the operational test and check-out period, the system will then be ready to enter post-launch OT&E. During this phase, the OT organization takes a final look at whether the system arrived on orbit successfully, if the performance reported throughout early integrated testing bears out in the operational environment of space, and that the system-of-systems environment represents the true operational architecture and operates as expected. A final OT&E report will be submitted to ensure all U.S. Code Title 10 requirements are satisfied.

INFLUENCE OF THE SPACE OT&E MODEL

Several changes in policies and procedures have already occurred due to introduction of SOTEM. The model has been presented in several forums and has been endorsed as a key to all aspects of future space system T&E.

USAF T&E Policy

Synchronized with the introduction of the model, Headquarters Air Force Test and Evaluation (HQ USAF/TE) began an update to Air Force Instruction (AFI) 99-103 to document the model. Working with AFOTEC, HQ USAF/TE drafted AFI 99-103, Capabilities-Based Test and Evaluation, Chapter 8 – Space Systems Test and Evaluation in early summer 2008, and then held a meeting with the staffs of the Assistant Secretary of the Air Force for Acquisition (SAF/AQ), Air Force Space Command (AFSPC), Space and Missile System Center (SMC), and AFOTEC in August 2008 to directly address detailed areas of concern with the draft AFI. This meeting allowed working-level action officer input to the formation of Air Force T&E policy, linking high-level guidance to achievable space system acquisition and test planning.

On 20 March 2009, SOTEM effectively became Air Force T&E policy with the publication of AFI 99-103 Incorporating Change 2.

NSS 03-01

During the action officer discussions for revising AFI 99-103, the Office of the Under Secretary of the Air Force for Space Acquisition (SAF/USA) raised the need to examine how SOTEM and the new AFI would align with the existing NSS 03-01, and possibly synchronize NSS 03-01 with an anticipated update in early 2009. Since AFOTEC Detachment 4, whose mission is to operationally test and evaluate space, missile, and missile defense systems in realistic battlespace environments, was the unit most affected by SOTEM, they took the lead to examine all these documents and drafted a list of changes to NSS 03-01 based on their research. Additional discussions between AFOTEC, AF/TE, SAF/USA, AFSPC, SMC, the Army Test and Evaluation Command, the Navy Operational Test and Evaluation Force and the Marine Corps Operational Test and Evaluation Activity led to the proposal to add a list of these changes as an enclosure during the NSS 03-01 update.

These discussions became irrelevant 23 March 2009, when the Under Secretary of Defense for Acquisition, Logistics and Technology (USD (AT&L)), John J. Young, rescinded NSS 03-01, replacing it temporarily with the Space Interim Guidance, which aligns space system acquisition (terminology, etc.) with all other DoDI 5000.02 acquisitions. New policy memoranda are being drafted by USD (AT&L) to replace this interim guidance. Eventually, USD (AT&L) will incorporate the policy for space system acquisitions into the DoDI 5000.02.

AF T&E Days Conference

In February 2009, AFOTEC and the American Institute of Aeronautics and Astronautics hosted the Air Force T&E Days Conference in Albuquerque, New Mexico. There were more than 400 attendees representing contractor, development and operational test disciplines; military and civilian; operators, engineers, analysts, scientists and other technical disciplines and functions.

Panels composed of senior military and civilian leaders representing the span of acquisition expertise were formed to discuss two areas from their different perspectives: 1) an optimal process for IDT/OT planning, and 2) how to use early influence and planning procedures for improving systems requirements development. Major General Sargeant also introduced the “workgroup” concept. The workgroups consisted of worker-level members from each of the panel organizations. The workgroups met following each of the general session panel discussions and further examined the challenges facing testers from the unique perspectives of each panel: operational test, acquisition, general officers, space, modeling and simulation (M&S), and enabling organizations. Before and during the conference, the workgroup members met to highlight major issues the members’ organizations were experiencing, identifying potential challenges in addressing those issues, analyzing the issues and challenges, and crafting possible solutions to the issues. Following the conference, the top issues, challenges and proposed solutions were published on the AIAA website as part of the T&E Days Conference proceedings.

The managers of the several workgroups documented all issues, challenges and proposed solutions in a detailed conference summary paper (Olinger et al 2009). During the writing and revision of this paper, the workgroup managers noted several items that were identified by two

or more workgroups, and the managers consolidated these issues, challenges and proposals in a common section. In addition to the issues common between workgroups, the Space Workgroup identified several unique issues. These issues included the space acquisition authority reporting directly to the system operator (Air Force Space Command versus Headquarters United States Air Force, like all other acquisitions), lack of sufficient design maturity early in the acquisition lifecycle, and the need to further develop the government/contractor IDT/OT partnership. The common proposal to addressing many of these issues was for all organizations to implement the tenets and structure of SOTEM into their policies, processes and procedures in order to leverage the early influence and IDT/OT opportunities the model identifies before launching a space system.

IMPLEMENTATION OF THE SPACE OT&E MODEL

AFOTEC has been refining SOTEM and its tenets since the 2008 summit, and used it on several programs, which have benefitted in reduced cost and schedule, and enhanced performance for warfighter use. Two of the most notable examples are the Wideband Global Satellite Communications (SATCOM) (WGS) and Space-Based Infrared System (SBIRS) programs.

Wideband Global Satellite Communications (WGS)

The Detachment 4 AFOTEC WGS test team was the first to apply SOTEM tenets, even before it was refined and codified. In the summer of 2007, AFOTEC realized the need to accelerate their planning and execution of operational testing of the WGS system due to changes in the program schedule. SOTEM was still in its conceptual stage at the time, but the situation called for rapid test planning and coordination with the launch of the first WGS satellite only a few months away in October 2007.

WGS provides high-capacity satellite communications with improved interoperability by enabling dissimilar X- and Ka-band terminals to communicate. WGS augments the DoD communications services currently provided by the Defense Satellite Communications System, Defense Satellite Communications System Service Life Extension Program, and Global Broadcast Service. WGS increases customer support by allowing the warfighter to schedule communications needs, such as the Defense Switched Network (DSN), Secure Internet Protocol Router Network (SIPRNET), Non-secure Internet Protocol Router Network (NIPRNET), and imagery intelligence products, in near real-time.

AFOTEC was the lead OT organization for WGS. AFOTEC used the integrated practices and collaborative efforts that became SOTEM during Wideband Global SATCOM (WGS) in 2008 operational testing to maximize the effectiveness of available test opportunities. The positioning of the WGS satellite during on-orbit check-out presented an opportunity for integrated testing using assets and resources already scheduled for the on orbit check-out as well as a number of Teleport and user terminals available within the Continental United States (CONUS). Additionally, this allowed AFOTEC to significantly reduce the time needed for dedicated operational testing. Based on these circumstances, AFOTEC conducted the testing in two phases: Integrated OT and Dedicated OT.

The Integrated OT phase was conducted simultaneously with on-orbit check-out, while the satellite was over the CONUS. This application of the early involvement and IDT/OT tenets of SOTEM allowed AFOTEC to exercise the agile analysis and reporting SOTEM tenet to provide

an operational test Status Report to the PEO prior to PEO certification. In turn, the rapid report enabled United States Strategic Command (USSTRATCOM) to accelerate their acceptance of WGS for operational use 10 months earlier than scheduled. This acceleration of WGS to operational use also saved \$180 million of space assets, operations and resources (Figure 2) that would have been incurred following the original operational test plans.

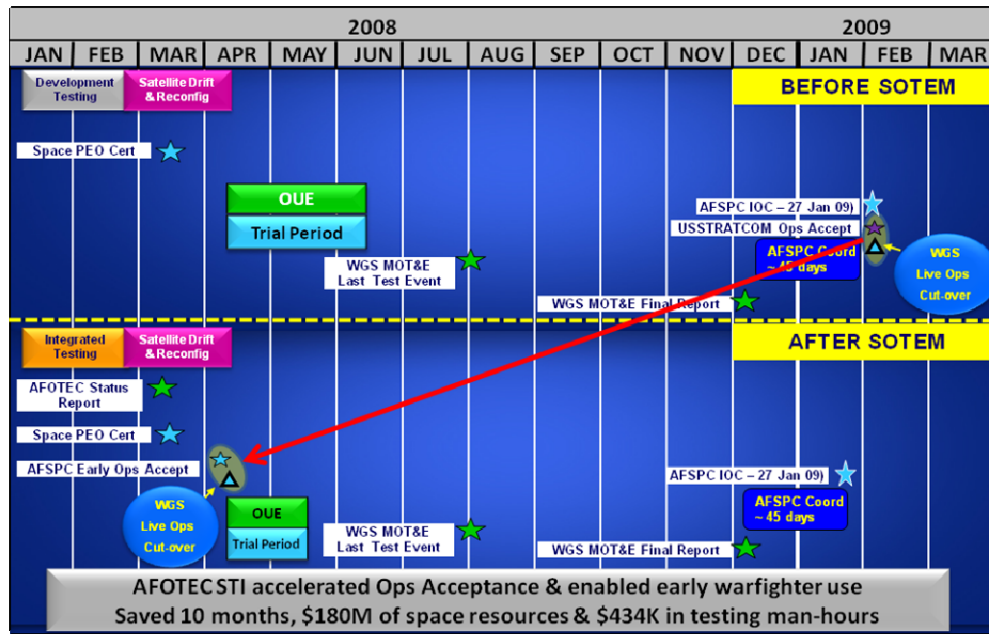


Figure 2. WGS cost/schedule savings due to SOTEM

The Dedicated OT phase was conducted shortly after the WGS satellite was moved to its operational orbit and USSTRATCOM declared it operational. AFOTEC early involvement and use of integrated testing allowed completion of 30% of OT measures during the Integrated OT phase. The Dedicated OT phase schedule reduction realized from the earlier Integrated OT phase saved \$434 thousand in man hours of AFOTEC operational testing (Figure 2).

The impacts of early integrated testing can also be viewed in the WGS Initial Operational Capability (IOC) decision. The WGS IOC decision informed stakeholders that WGS had met its initial operation requirements and deadline. Due to the IOC decision, warfighters can start planning for larger bandwidth availability (up to 10 Megabits per second (Mbps) versus former maximum of 1 Mbps), a new two-way Ka-band transmission that is significantly faster than current DSCS X-band transmission, and an upgraded Satellite Access Request process to meet the new requirements.

Space-Based Infrared System (SBIRS)

The second example of AFOTEC's initiative to implement SOTEM and accelerating delivery of warfighters needs to strategic and theater users is the recent successful operational testing of the Space-Based Infrared System (SBIRS) Highly Elliptical Orbit (HEO-1) payload and the HEO Operations Center. AFOTEC's early involvement in DT efforts accelerated HEO-1's operational acceptance by six weeks and certification for use by eight weeks.

SBIRS is a consolidated system intended to meet United States infrared space surveillance needs through the first two to three decades of the 21st century. The SBIRS program addresses warfighters' critical needs in the areas of missile warning, missile defense, battlespace awareness, and technical intelligence. The delivery of HEO-1 data to the warfighter provides enhanced capability to theater military commanders worldwide.

As a key participant in the SBIRS System Engineering and Integration Team, AFOTEC conducts numerous requirements verification and integrated system tests. These tests verify the functionality of space-ground interfaces, communication links and the spacecraft bus functionality to assess system capabilities prior to launch. AFOTEC's HEO-1 Operational Utility Evaluation (OUE) conducted September through November 2008 leveraged IDT/OT coupled with agile reporting to bring these enhanced capabilities to the users earlier than expected.

During OUE execution, AFOTEC efforts enabled the SPO to accelerate the HEO-1 delivery by integrating OT test requirements with the developer's planned development testing to meet operational test objectives. The increased emphasis on integrated testing by the SBIRS test team enabled the use of pre-OUE DT/OT data to confirm readiness for the OUE. Engaging early with the DT contractor in hardware, software and network interface tests, worldwide end-to-end testing, and modeling and simulation, AFOTEC executed approximately 40 percent of OT&E mission effectiveness test events before the start of the OUE. The AFOTEC SBIRS test team also took advantage of Air Force Space Command's 60-day HEO-1 live operational trial period activities to concurrently execute and report OT requirements in a real-time, live environment. As indicated in Figure 3, these combined efforts enabled HEO-1 missile data delivery to the warfighter approximately six weeks earlier than scheduled (early December 2008 versus late January 2009). By using the most agile reporting to date, AFOTEC informed the Air Force Space Command operational acceptance decision of HEO-1 in November 2008 and enabled a U.S. Strategic Command system certification eight weeks early in December 2008.

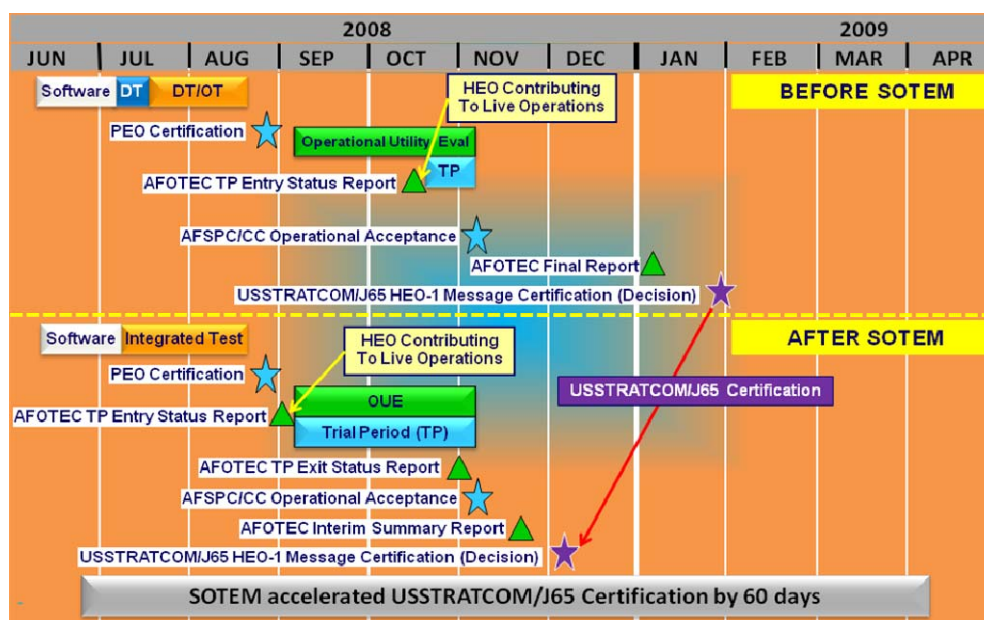


Figure 3. SBIRS HEO schedule savings due to SOTEM

AFOTEC also conducted testing of a second HEO payload, known as HEO-2, from June to August 2009. Although HEO-2 was not originally planned for operational testing, AFSPC capitalized on the HEO-1 operational test momentum created by the SOTEM approach. AFSPC will be able to accelerate HEO-2 transition into the SBIRS constellation and earlier operational acceptance and delivery of these critical capabilities to the warfighter, achieving yet another milestone for the SBIRS community.

The HEO-1 and HEO-2 OUEs successes were due to the cooperation of the many agencies involved in the lengthy and detailed application of the SOTEM process. The SBIRS test team is currently using the same tenets of SOTEM by planning parallel, IDT/OT test events for the next phase of the SBIRS constellation, the launch of the first SBIRS Geo-stationary Orbit (GEO) satellite scheduled for late 2010.

AFOTEC's early involvement in SBIRS GEO testing leverages many planned pre-launch test and readiness events. The SBIRS test team will participate in and independently analyze results of these events to provide operationally-relevant data to decision-makers for the GEO-1 Consent to Ship and Consent to Launch decisions, as well as to the Operational Acceptance and Certification for Use decisions after launch.

Other examples of planned AFOTEC early involvement in tests of SBIRS include verification of interfaces between the ground software and the GEO spacecraft simulator, and follow-on testing of the final version of the ground software and network interfaces to the actual SBIRS GEO spacecraft using final flight software. AFOTEC will assess the functionality of the SBIRS GEO satellite safing system prior to the spacecraft being on-orbit, a proactive test approach that deviates from traditional operational space testing.

AFOTEC's success during early involvement and IDT/OT efforts with the developing contractor will lead to the GEO-1 Consent to Ship to the launch site. Once on the launch pad, AFOTEC will participate in detailed launch and early orbit run-through tests conducted with the actual spacecraft before launch to verify the SBIRS spacecraft's ability to communicate with the Air Force Satellite Control Network.

As with HEO testing, AFOTEC plans to participate in the GEO-1 Day-In-The-Life (DITL) pre-launch tests and independently assess the software performance in an on-orbit, normal operational environment. AFOTEC's involvement extends further than the spacecraft and interfacing networks. The AFOTEC SBIRS test team will be involved in several operational readiness events to assess crew training and software human factors to validate training and procedures for launch and early orbit operations.

The AFOTEC proactive approach, implementing SOTEM, has been the key enabler for unprecedented success for the AFOTEC SBIRS test team, and additional evidence of its utility to the field of operational testing of space assets.

SUMMARY & CONCLUSIONS

In light of recent success with integrated operational testing of WGS and SBIRS that accelerated meeting warfighter needs, it is clear that AFOTEC has come a long way toward

realizing the vision of Major General Sargeant. Establishment and institutionalization of SOTEM has been “a watershed event for current and future testing of Department of Defense space systems. [It] enables better space warfighting systems acquisition through early, continuous integrated testing to ensure the system addresses the mission capability gap and enables early program decisions when changes are less costly.” (Gandara 2008)

Based on SOTEM and the results achieved to date, the best course of action is that the model be integrated into space system acquisition policies and procedures throughout all applicable organizations within DoD, and with industry partners involved in development of space and space support systems. The first step is for organizations such as the Space and Missile Systems Center, Air Force Materiel Command, and Electronic Systems Command to receive training from SOTEM advocates such as AFOTEC, AFSPC and AF/TE on the model. These advocates would then be able to assist incorporating the model into their organizations. The Air Force should follow this same path with all other appropriate DoD and government agencies, such as NASA, and National Defense Industrial Association (NDIA) members involved with development of space and space support systems.

Another step should be the establishment of a process improvement working group to continue refinement of the model at least annually. This working group would need to consist of representatives from applicable government agencies and supporting organizations, and representatives from industry partners of all sizes (large and small).

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BIOGRAPHIES

Major Bole (Kenneth.Bole@us.af.mil) is the Senior Engineer of the Test Infrastructure Division at Headquarters AFOTEC. In his 18+ years in the US Air Force, he has leadership experience in software development, satellite communications support operations and maintenance,

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Capt Putney (Russell.Putney@peterson.af.mil) is the Test Director for WGS and GPS systems, at AFOTEC Detachment 4, Peterson Air Force Base, Colorado. In his 22 years in US Air Force, he has experience with vehicle maintenance, network communications center operations, deployable communications operations and maintenance, information systems management, and satellite systems operational test and evaluation. He has held leadership of a Network Control Center and a Theater Deployable Communication system suite, and has been a Flight Commander of Information Systems. In 1995, he was selected for the World Class Athlete Program and placed 6th in the world for Greco Roman wrestling. He holds both a BS and MS in Information Systems from the University of Phoenix.

Section 4

SPACE SYSTEM OT&E
Extracted from AFOTEC Manual 99-101, OPERATIONAL TEST PROCESSES AND PROCEDURES (DRAFT)

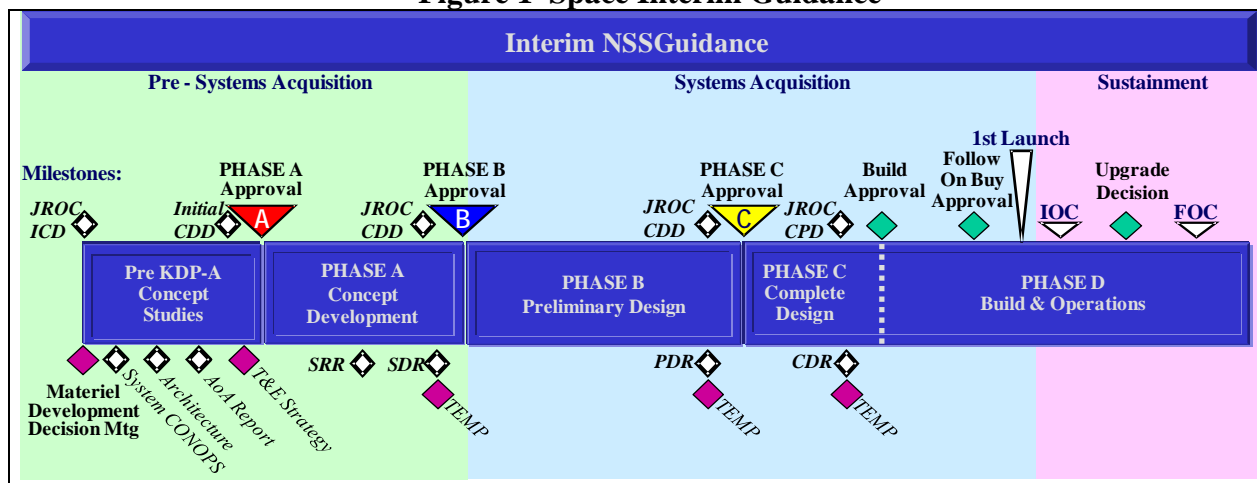
Note: The following is the Space Systems OT&E sections extracted from the AFOTECM 99-101, *OPERATIONAL TEST PROCESSES AND PROCEDURES (DRAFT)*. This is meant **ONLY** to be used as a reference and “memory jogger.” Refer to complete instruction for complete guidance.

Introduction (AFOTECM 99-101, Ch 1)

Space Systems OT&E. The need for fully informed decisions regarding increasingly expensive, yet indispensable space system capabilities is crucial in today’s environment of constrained resources. For over 20 years, AFOTEC and the other Service operational test agencies (OTA) conducted OT&E of space and other high-tech, limited quantity systems using a model more appropriate for military systems with production decisions for large-quantity buys. Using an OT&E model that does not match the system’s acquisition strategy renders the results of OT&E largely irrelevant. AFOTEC uses the Air Force Space Systems OT&E model that better fits the National Security Space (NSS) system’s acquisition model outlined in the NSS Acquisition Policy Interim Guidance for DoD Space System Acquisition Process (also referred to as “Space Interim Guidance”) and provides fact-based decision quality data to decision makers in time to support key space system acquisition decisions.

Acquisition of space major defense acquisition programs, which were granted a waiver to the DoD 5000 requirements, follow procedures contained in the Space Interim Guidance. The Air Force space test and evaluation (T&E) policy directs early activities and additional actions that provide earlier OT&E influence and better support space acquisition programs developed under the Space Interim Guidance. The Space Interim Guidance uses a streamlined acquisition framework with milestone decisions that occur earlier than typical DOD 5000-series milestones and decision reviews. Figure 1 depicts the acquisition process for space programs under the Space Interim Guidance and also shows the JCIDS process adaptations for space programs.

Figure 1 Space Interim Guidance



In a traditional acquisition program governed by Department of Defense Directive (DoDD) 5000.01, expenditures are relatively small in the Research and Development (R&D) and investment

phases, compared to the cost of production and system operation. For these traditional acquisitions, OT occurs just prior to the major investment or production decision and provides data to inform those decisions adequately. Most of the investment for space systems occurs early in the program, most often without a major production decision. In the past, OT&E took place at the same point in the acquisition cycle as the DoDD 5000.01 programs. However, early in Space Interim Guidance programs, most of the investment has been made, most of the key acquisition decisions have been made, and the critical operational decision to launch the satellite has been made and executed. Additionally, the ground station and associated software often lag in deployment making timely post launch OT&E difficult, if not impossible. Making these key decisions prior to the execution of OT&E severely limits the value of OT&E.

AFOTEC's implementation of the Air Force space T&E model provides an OT&E that better fits the space systems' acquisition model, delivering better value to both the acquisition and operational decision makers by moving OT&E activity well prior to launch. The three key tenets of the Air Force space T&E model are: early and continuous IDT/OT involvement throughout the system's life cycle; agile analysis and reporting; and focus on system-of-system evaluations.

AFOTEC's space test approach provides the basis for knowledge-based acquisition and operational decisions throughout the life cycle of our national security space systems. The approach provides early operational involvement delivering a number of benefits as listed in Table 1

Table 1. Space Test Approach Benefits

Ensuring the warfighter receives needed mission capabilities.
Providing early clarity and continued update of operational requirements.
Influencing early and continual development and refinement of the CONOP.
Ensuring frequent reviews of threat documents to ensure the system design addresses current and future threats.
Highlighting program shortfalls and benefits throughout the development process when they can be addressed most efficiently and inexpensively.
Allowing the user to understand and accept acquisition risks and adjust their mission requirements and plans accordingly.
Addressing and correcting systemic suitability issues early in the program's development.

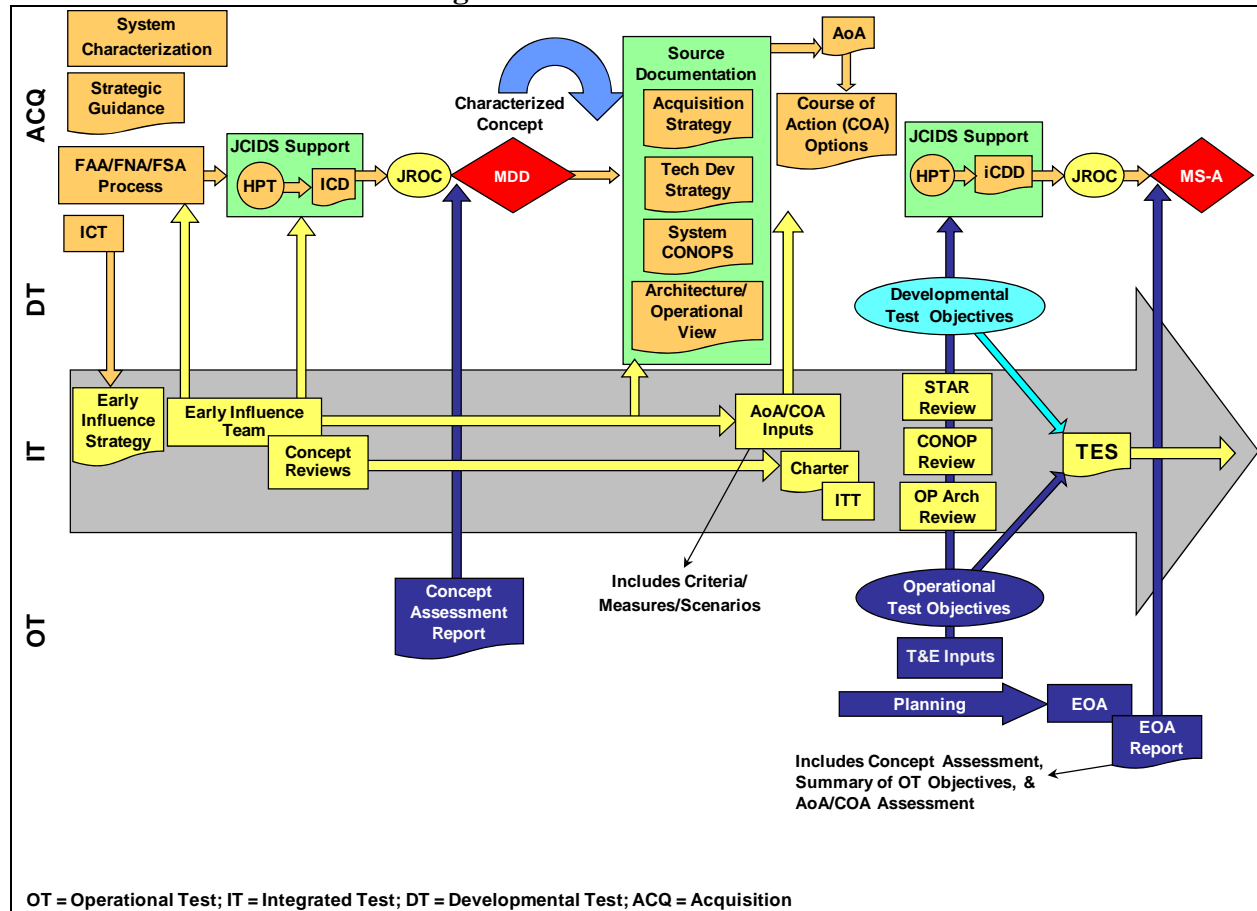
The Det/CC responsible for space systems needs to refer to the guidance and procedures contained in the remainder of AFOTECMAN 99-101 and comply with the AFOTEC processes as applicable to specific programs. Successful implementation of the space systems T&E approach is dependent on a clear understanding of the policy and procedural concepts contained in the *Space Interim Guidance* and AFI 99-103, Chapter 8, *Space Systems T&E*. NOTE: Using the space systems OT&E model for cyberspace/information technology systems or user equipment segment programs acquired under the Space Interim Guidance acquisition model may not be appropriate. The Det/CC responsible for space systems also needs to refer to the *MOA on Multiservice OT&E* for specific procedures regarding lead or supporting OTA activities.

AFOTEC SPACE OT&E Activities Supporting Milestone A (AFOTECM 99-101, Ch 2)

Pre MS A Activities for Space Acquisition. Beginning early in the acquisition process, the acquisition community receives strategic guidance, or a description of the operational mission need (see Figure 2). The acquisition community begins development of the initial functional solution

analysis or system concepts to address the operational mission need. During the pre-MS A phase, the group responsible for building operational requirements forms the integrated concept team (ICT). During the pre MS A period, the IDT/OT community begins development of an early influence strategy (EIS). The EIS tailors the generic space T&E model to the specifics of the program taking into consideration the required decisions, development, and testing activities. The early influence team (EIT) will review and influence early concepts, studies and initial JCIDS documents (i.e., the ICD), etc. for new space systems. The EIT will also write an ITT charter and then stand up a formal program ITT.

Figure 2. Pre- MS-A Activities



The integrated concept team (ICT) is formed by AF Space Command (AFSPC) to mature the results of the functional capability analysis into an operational capability requirement. Developmental and operational testers participate in the ICT to review and provide early influence inputs on test issues related to the functional analysis documentation. As the ICT develops the functional solution analysis and the draft ICD, the IDT/OT community is involved in the early reviews of the proposed concepts in order to generate a concept assessment report. The report provides input to the concept decision, focused on the degree to which the system concept meets the mission needs stated in the strategic guidance.

While the acquisition community moves into the solution definition phase, the IDT/OT community participates in the AoA and COA development processes. The EIT's participation in the AoA provides candidate evaluation criteria, potential measures of effectiveness and suitability, and operational scenarios for each feasible alternative being considered. After the acquisition community develops the AoA and COA, the ITT develops the first TES by melding development test and operational test objectives.

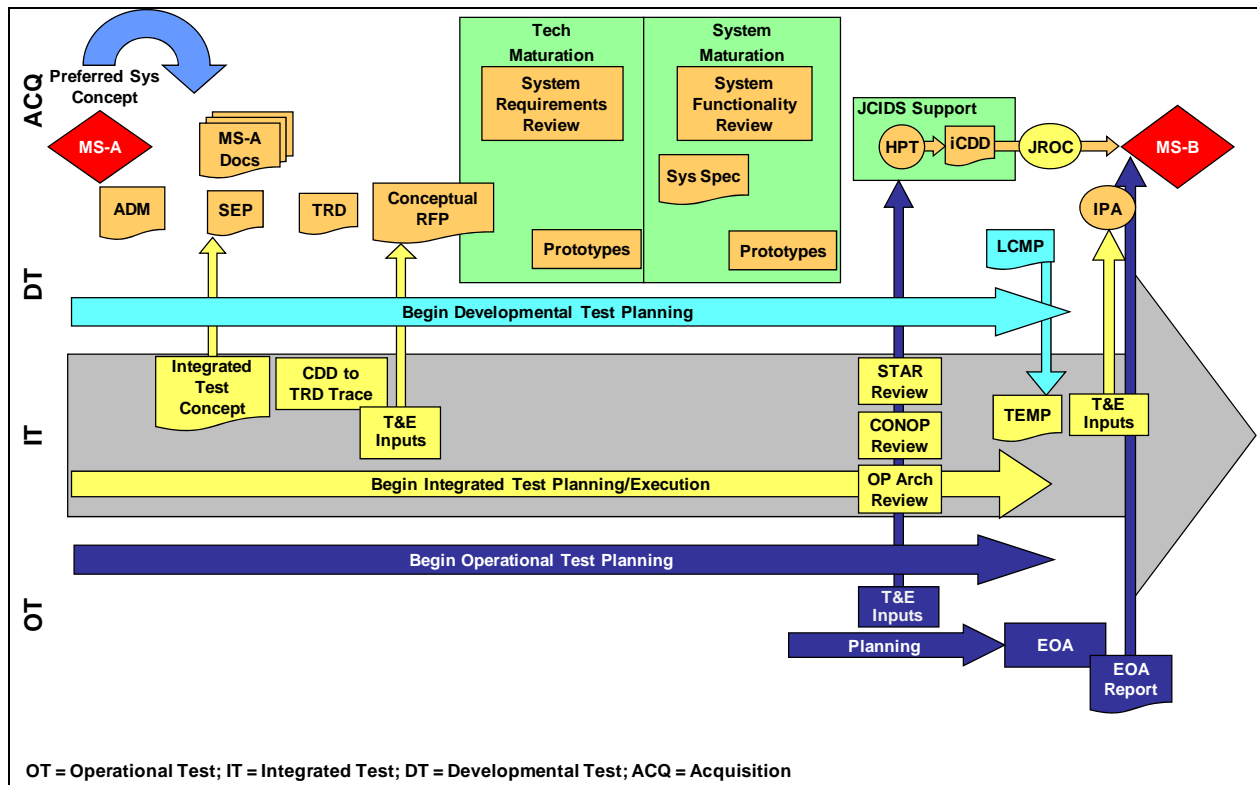
The operational test communities participation in pre MS-A activities culminate in an early operational assessment (EOA) to inform the MS-A decision maker. The EOA reports: the degree to which the proposed mission capability will provide coverage of the identified gap; feasibility of the capability based on current or expected maturity of technology; and potential issues related to the proposed test concept with regards to operational effectiveness and suitability. The EOA report does not advocate or recommend an alternative.

AFOTEC Activities Supporting Milestone B (AFOTECM 99-101, Ch 3)

Integrated Program Summary (IPS) for Space System Acquisitions. Prior to the MS B space system defense acquisition board (DAB), the DoD space MDA will convene an independent program assessment team (IPAT) to advise on the program's readiness to advance into the next acquisition phase. The IPAT's findings and recommendations are presented to the DoD space MDA at the MS B DAB. In preparation for the independent program assessment (IPA), the system program director (SPD)/program manager (PM) produces a consolidated set of program documentation, known as an IPS, to facilitate the IPAT review. AFOTEC may be asked to provide input to the T&E portions of the IPS.

Concept Development Phase for Space Acquisitions. Throughout the MS A to MS B concept development phase, the acquisition community refines the acquisition concept and matures both the technology and functional capabilities of the system (see Figure 3). Meanwhile, the ITT continues to refine the TES and builds the IDT/OT concept. During the concept development phase, as the acquisition community translates the operational requirements into a set of technical requirements to serve as the basis of the RFP, the ITT evaluates the traceability between the CDD and the technical requirements document (TRD). The ITT's look at traceability focuses on the translation of operational requirements into the technical requirements that will ultimately serve as the basis for the system design. Throughout the system requirements review and system design review process, the technical maturation and functional development process generates concepts and prototypes. The ITT may assess these prototypes to evaluate their potential operational effectiveness, suitability, degree to which they will meet the operational mission need, and to highlight any other operational issues noted during early testing. The IDT/OT planning process culminates in the publication of the initial version of the TEMP describing the IDT/OT approach. Finally, an EOA is conducted to assess the system's concept just prior to MS B in order to inform the MS B decision with an operationally focused assessment of the system concept.

Figure 3. MS A to MS B Activities

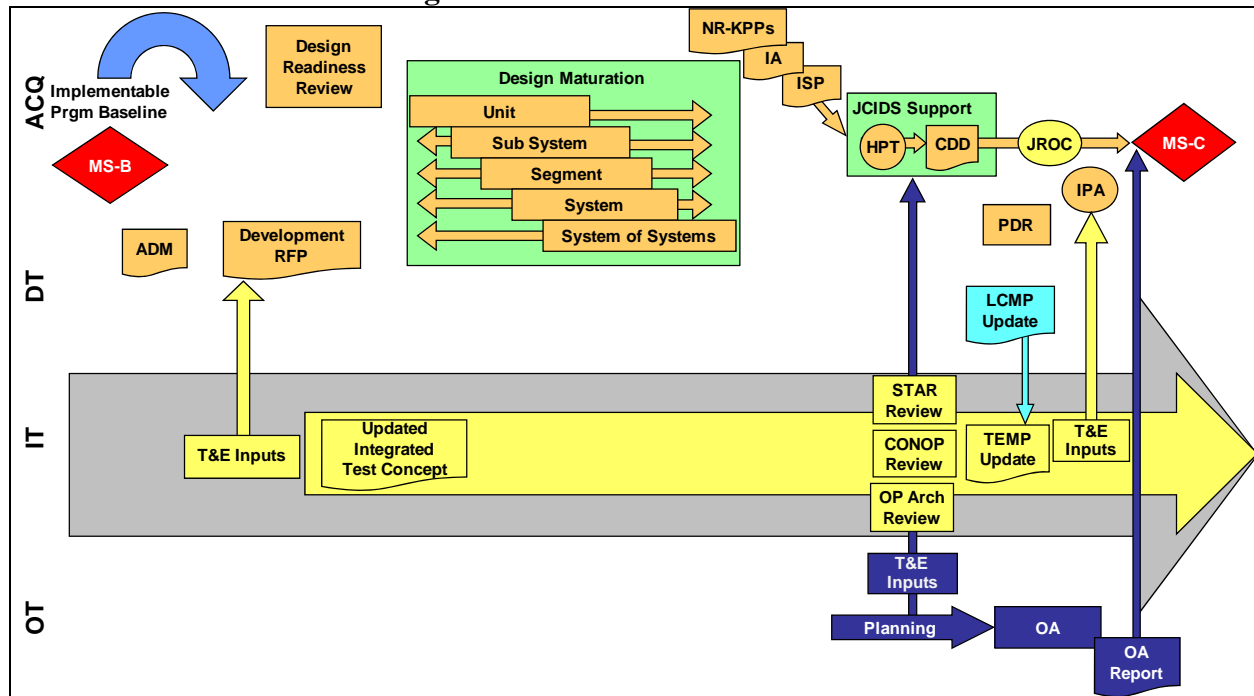


AFOTEC Activities Supporting Milestone C (AFOTECM 99-103, Ch 4)

Preliminary Design Phase for Space Acquisitions. In the MS B to MS C preliminary design phase (see Figure 4), the acquisition community refines the system design through a series of design reviews and technology demonstrations. The ITT further refines their IDT/OT concept, wrapping up the preliminary design phase with a TEMP update that fleshes out the details of how some OT objectives will be addressed during traditional dedicated DT testing activities, such as laboratory and chamber testing.

Operational Assessments for Space Systems. Testers will use OAs (including EOAs on prototypes) to provide the insight into system progress toward operational effectiveness, suitability, as well as progress toward readiness for eventual IOT&E. An OA will be executed to support the build approval decision. OA content should be tailored to meet the decision-maker's needs. Det/CCs are required to develop an OA Plan prior to conducting the OA. The OA Plan will be approved by the AFOTEC/CC. An OA report will be produced and approved by the AFOTEC/CC prior to the milestone decision review.

Figure 4. MS-B to MS-C Activities



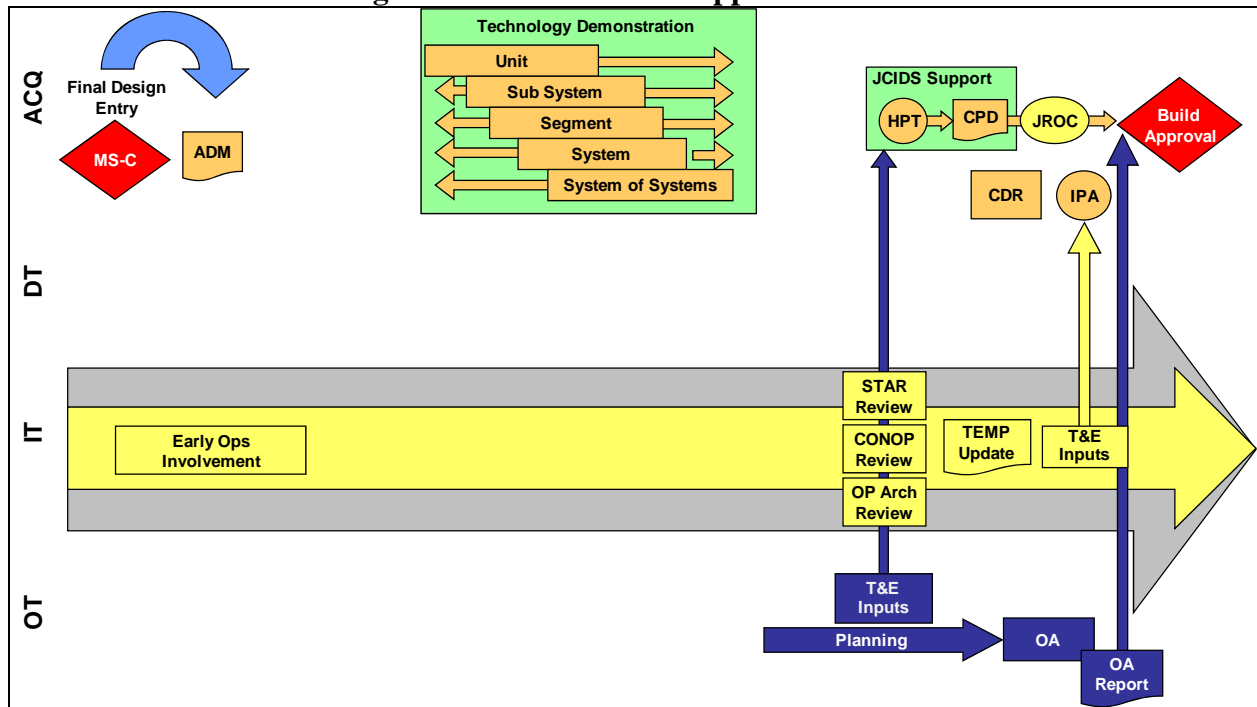
During the preliminary design phase, developers conduct technical demonstrations to evaluate components of the proposed system. The OTA conducts an OA to aggregate the information gathered through the preliminary design stage to inform the MS C decision authority on the progress being made towards operational effectiveness, suitability and mission capability. Additionally, if the MS C authority is planning to decide on the procurement of long lead items as part of the MS C decision, the OA should be tailored to include an evaluation of the operational aspects of those system components to aid in the decision making. For space systems, the CDD is updated prior to MS B and C.

AFOTEC Activities Supporting FRP/IOC/Fielding Decision (AFOTECM 99-103, Ch 5)

Integrated Program Summary (IPS) for Space System Acquisitions. Prior to the Build Approval space system DAB, the DoD Space MDA will convene an IPAT to advise on the program's readiness to advance into the next acquisition phase. The IPAT's findings and recommendations are presented to the DoD Space MDA at the Build Approval DAB. In preparation for the IPA, SPD/PM produces a consolidated set of program documentation, known as an IPS, to facilitate the IPAT review. AFOTEC may be asked to provide input to the T&E portions of the IPS.

Final Design Phase thru OT&E for Space Acquisitions. In the final design phase (see Figure 5), the acquisition community refines the system design and conducts a series of risk-reduction tests, building up from unit tests, to subsystems, to segments, to operational system, and finally a system of systems tests. The T&E community is involved with all testing activities. ITT participation is collaborative in nature and fosters communication between testers and developers. After the conclusion of the critical design review (CDR), the OT&E community produces an operational assessment report on the progress towards operational effectiveness and suitability. The CDR and operational assessment report inform the build approval decision.

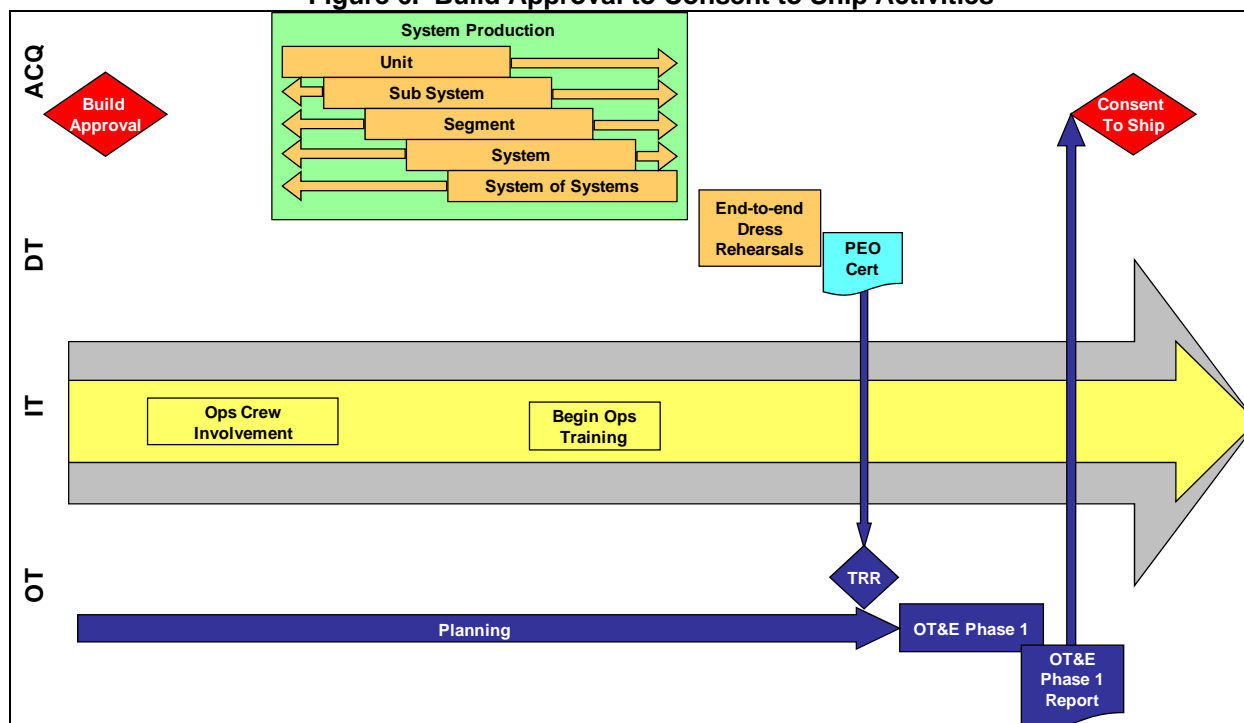
Figure 5. MS-C to Build Approval Activities



High Performance Teams for Space System CPDs. The responsible detachment is the primary AFOTEC representative for all AF/A5RD HPTs. A-3O or other HQ SME may be requested to support HPT preparation or attend the HPT. HPTs support the JCIDS process to produce the CPD.

System Production to OT&E Phase I. After build approval (see Figure 6), the acquisition community produces the system and conducts a series of test activities, building up from the unit, to subsystem, to segment, to operational system, to complete system of systems testing. During the system production to OT&E phase I period, the ITT participates in the testing - taking full advantage of planned DT events to inject OT test measures and scenarios and gather information to fulfill OT&E test objectives. The system production period culminates in an OT&E phase I, with its associated program element officer (PEO) certification and test readiness review (TRR) processes. The OT&E phase I puts the system in as near an operational environment as can be replicated on the ground, in order to support OT&E to inform the consent to ship decision. The phase I OT&E takes into consideration the results of IDT/OT, as well as the status of the system-of-systems required to provide mission capability to the warfighter. For example, the OT&E report may highlight that the satellite is ready for launch, but the ground segment will not be completed for another two years, allowing for a conscious decision to delay satellite preparation for launch until the right time to optimize value to the warfighter.

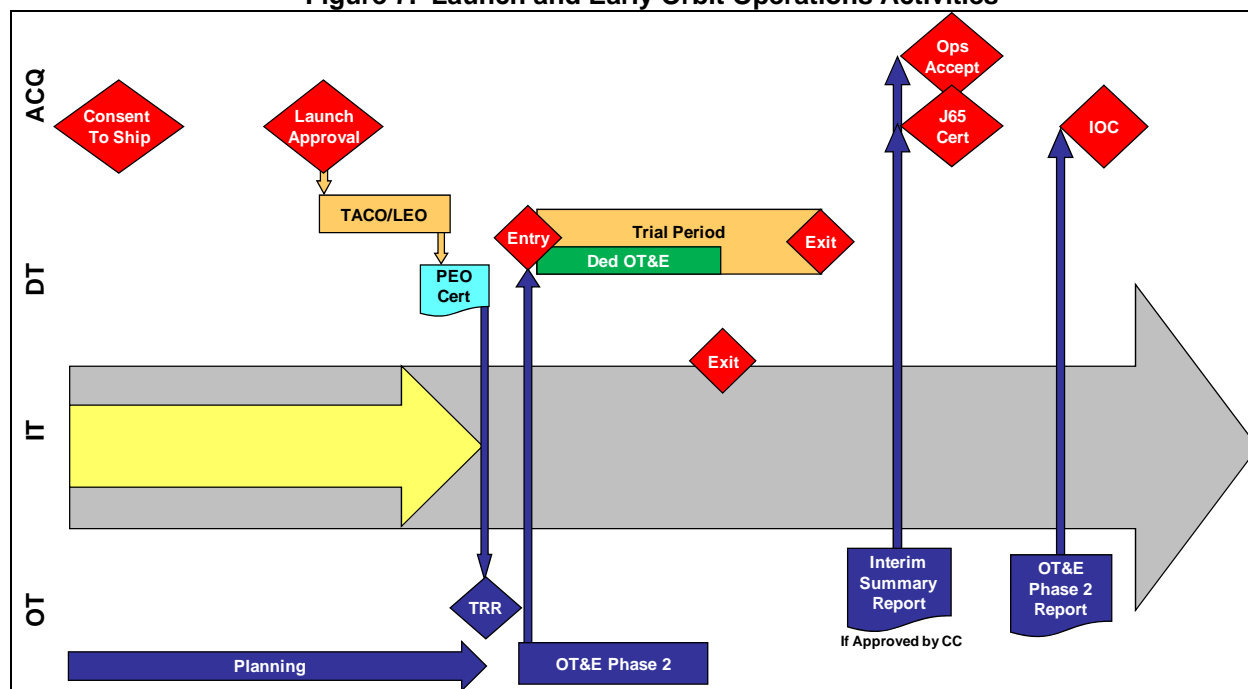
Figure 6. Build Approval to Consent to Ship Activities



Launch Range Compatibility Testing. After the decision to ship the satellite from the manufacturing facility, the system is moved to the launch range, mated with the booster, and final integration and communication testing occurs. Again, IDT/OT will inject OT test measures and scenarios into the DT-centric checkout events to provide an operational impact to any technical issues identified during compatibility testing. Operational impacts discovered during IDT/OT inform decision-making at the launch go/no-go decision point.

Launch and Early Orbit Operations, OT&E Phase II. After launch (see Figure 7) and during test and checkout (TACO), early orbit operations, and sensor checkout, the operational testing community participates to the greatest extent possible to inject operationally realistic scenarios, backgrounds, and procedures. At the conclusion of the TACO period, the PEO certifies the system is ready to enter OT&E phase II, the final checkout of the system of systems operational capability. OT&E phase II takes a final look at the overall system performance in the operational environment of space as compared to earlier IDT/OT results and validates the operational capability of the entire integrated system of systems. AFOTEC conducts OT&E phase II in conjunction with the users' operational trial period to facilitate delivering mission capability to the warfighter. AFOTEC will complete their data analysis and produce an interim summary report (if approved by the AFOTEC/CC) with decision quality data for use by the end user to make a decision regarding trial period exit and an operational acceptance decision. Finally, AFOTEC publishes the OT&E report to provide full details of the analyzed results. The OT&E report informs DOT&E's report to Congress, IOC decisions, future system upgrade decisions, etc.

Figure 7. Launch and Early Orbit Operations Activities



AFOTEC Activities Following FRP/IOC/Fielding Decision (AFOTECM 99-103, Ch 6)

There are no specific AFOTEC space operational test and evaluations activities following full rate production (FRO), initial operational capability (IOC) or fielding decisions. The test team will conduct test program closeout and disposition activities as required by AFOTECM 99-101.

Test and Evaluation Activities and Documentation by Acquisition Phase

The following tables (table 1 thru 5) are a compilation of acquisition activities and documentation found throughout DoD and Air Force directives and policy publications. These are the typical acquisition activities and documentation called for in DoD 5000 series regulations and statutes. Programs may have tailor activities and documentation as needed.

Figure 1: DoD 5000

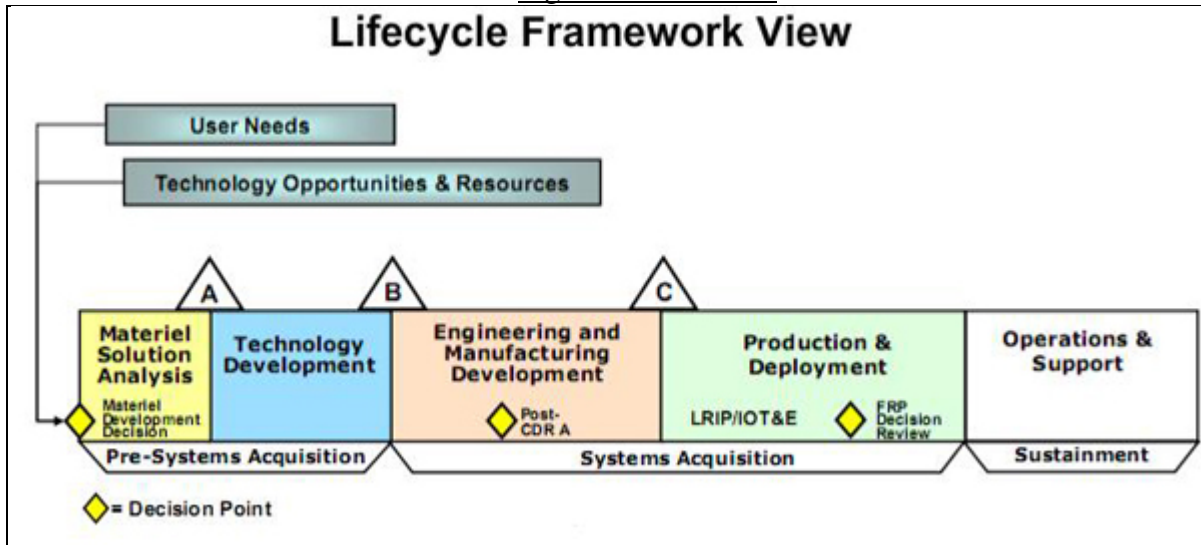


Figure 2: NSS Space Interim Guidance

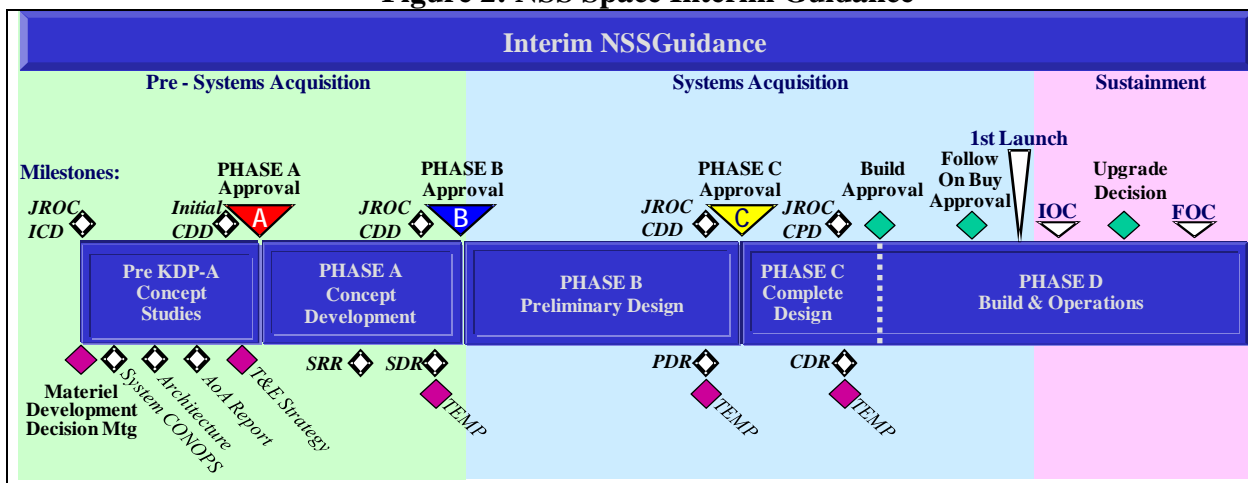


Table 1: Pre Milestone A Activities (Material Solution Analysis)

Document / Activity	OPR	AFOTEC Involvement
Acquisition Information Assurance Strategy	SPO	
Acquisition Strategy with DoD Strategic Plan	SPO	
Acquisition Decision Memorandum (ADM)	MDA	✓
Analysis of Alternatives (AoA)	MAJCOM	✓
Course of Actions (COA) Options	SPO	✓
Clinger Cohen Act (CCA) Compliance Table	SPO	
Information Assurance (IA) Implications Proposed CONOPS	MAJCOM	✓
Integrated Program Summary (IPS)	SPO	✓
Validated JCIDS Initial Capabilities Document (ICD)	MAJCOM	✓
JCIDS Initial Capability Development Document (iCDD) (AFROC)	MAJCOM	✓
Material Development Decision (MDD)	MDA/SPO	
Operational View (OV) of Integrated Architecture	MAJCOM	✓
Status Report on Independent Cost Assessment (ICA)	ICAT	
Systems-Level Concept of Operations (CONOPS)	MAJCOM	✓
Team Composition and IPA Plan and Agenda	IPAT	
Technology Development Strategy (TDS)	SPO	✓
Test and Evaluation Strategy (TES)	SPO	✓
Milestone A Decision	MDA	

Table 2: Phase A Activities (Technology Development)

Document / Activity	OPR	AFOTEC Involvement
Acquisition Information Assurance Strategy	SPO	
Acquisition Program Baseline (APB)	SPO	
Acquisition Strategy	SPO	✓
ADM MDA		✓
Affordability Assessment	SPO	
AoA to Support Milestone B	MAJCOM	✓
CCA Compliance Table	SPO	
CONOPS Updated	MAJCOM	✓
Corrosion Prevention Control Plan	SPO	
Cost Analysis Requirements Description (CARD)	SPO	
Earned Value Management System (EVMS)	SPD/PM	
Human Systems Integration (HSI) Plan	SPO	
Independent Cost Assessment (ICA)	MDA	
Information Support Plan (ISP)	SPO	✓
Initial Assessment of Mission Protection Measures	SPO	
CDD with Requirements Correlation Table (RCT)	MAJCOM	✓
Initial Information Assurance Strategy Plan	SPO	✓
Initial Programmatic ESOH Evaluation (PESHE) Documents	SPO	✓
Initial Risk Management Plan	SPO	

Document / Activity	OPR	AFOTEC Involvement
Initial System Internal & External Segment Synch Plan	SPO	
Initial System View (SV) & Initial Technical View (TV)	SPO	
Integrated Logistics Support (ILS) Plan	SPO	✓
Integrated Master Schedule (IMS)	SPO	✓
JROC Approved NSSO Architectures SPO		
Legal Review of Acquisition Strategy	SPO	
New Start Certification	MDA	
OV Architecture Products	MAJCOM	✓
Preliminary Design Review (PDR)	SPO	✓
Proposed Solution(s) Cost Estimate	MAJCOM	
Reliability, Availability, & Maintainability (RAM) Strategy	SPO	
Space Situational Awareness (SSA) Support	SPO	
System Design Review (SDR)	SPO	✓
System Requirements Review (SRR)	SPO	✓
System Specification (A Spec)	SPO	
System Threat Assessment Report (STAR)	SPO	✓
Systems Security Authorizations Agreement Accreditation	SPO	
Technology Maturity Assessment	SPO	
Technology Readiness Assessment (TRA)	SPO	
Test and Evaluation Master Plan (TEMP)	SPO	✓
Milestone B Decision	MDA	

Table 3: Phase B Activities (Engineering & Manufacturing Development)

Document / Activity	OPR	AFOTEC Involvement
Acquisition Information Assurance Strategy	SPO	
New Start Certification	SPO	
Acquisition Strategy	SPO	✓
Acquisition Strategy Certification Update	SPO	
Acquisition Strategy Legal Review	SPO	
ADM MDA		✓
Affordability Assessment	SPO	
APB Update	SPO	
CARD Update	SPO	
CCA Update	SPO	
JROC CDD with RCT Update	MAJCOM	✓
Conduct Risk Reduction	SPO	
Conduct Technical Design Reviews (e.g., PDR)	SPO	✓
Depot Maintenance Analysis	SPO	
Development Specification(s) (i.e., B Spec)	SPO	
Frequency Allocation for Stage 2 Experimental Application	SPO	

Document / Activity	OPR	AFOTEC Involvement
Functional Availability Analysis (annually)	SPO	
IA Strategy Update	SPO	✓
ICE Status Report	ICAT	
Initial Integrated Architecture	SPO	✓
Integrated Logistics Support Plan Update	SPO	✓
Integrated Architecture Update	SPO	
Interface Requirements Specifications (IRSs)	SPO	
IPS SPO		✓
ISP section of IPS	SPO	
JROC Approved NSSO Architectures Review	SPO	
LRIP Quantity Determination	DOT&E	✓
Life Cycle Cost Estimate	SPO	✓
Mission Protection Updates	SPO	
OV, SV, & TV Products Update	SPO	
Periodic Reporting Products (e.g., SARs, UCRs, etc.)	SPO	
PESHE with ESOH Data Update	SPO	✓
Pre-planned Product Improvement Plan	SPO	
Program Protection Updates	SPO	
Risk Management Plan Update	SPO	
Security Plan Updates	SPO	
Software Architectural Design	SPO	
Software Detailed Design	SPO	
Software Life Cycle Model	SPO	
Software Requirements Specifications (SRSs)	SPO	
Sustainment Plan Update	SPO	
System Disposal Initial Plan	SPO	
System Internal/External Segment Synch Plan	SPO	
System Level CONOPS Update	MAJCOM	✓
Team Composition and IPA Plan and Agenda	IPAT	✓
Technology Maturity Assessment	SPO	
TEMP Update	SPO	✓
Operational Assessment	OTA	✓
Milestone C Decision		

Table 4: Phase C Activities (Production & Deployment)

Document / Activity	OPR	AFOTEC Involvement
"Approval to Operate" Requested	SPO	
System Demonstration Sub-Phase Conducted	SPO	
Acquisition Strategy Legal Review	SPO	
APB SPO		

Document / Activity	OPR	AFOTEC Involvement
Appropriate Specification(s) (i.e., Prod/C Spec)	SPO	
Capability Production Document (CPD) with RCT	SPO	
CARD Updated	SPO	
CCA Table Updated	SPO	
CDR Logistics Management Information	SPO	
Component CIO's CCA Confirmation Obtained	SPO	
Conduct Risk Reduction	SPO	
Continue Test and Evaluation Activities (IOT&E)	OTA	✓
Contractor Support Established	SPO	
Depot Maintenance Analysis	SPO	
Frequency Allocation Stage 2 Experimental Application	SPO	
IA Certification Tested	SPO	✓
Interface Requirements Specifications (IRSs) Finalized	SPO	
ISP Updated	SPO	
JROC Approved NSSO Architectures Reassessment	SPO	
Life-Cycle Cost Estimate Documented	SPO	
LRIP Items Produced	SPO	
Mission Protection Plan Updated	SPO	
OV, SV and TV Updated Products	SPO	
PESHE Updated	SPO	✓
Program Protection Plan Updated	SPO	
Program's Certification Updated in Acquisition Strategy	SPO	
Required Periodic Reporting Products	SPO	
Risk Management Plan Update	SPO	
Security Plan Updated	SPO	
Software Architectural Design Finalized	SPO	
Software Detailed Design Determined	SPO	
Software Requirements Specifications (SRSs) Finalized	SPO	
System Disposal Plan Update	SPO	
System Internal and External Segment Synchronization Plan	SPO	
System Security Authorization Agreement	SPO	
Technical Design Reviews (e.g., CDR)	SPO	✓
TEMP Update	SPO	✓
Beyond-LRIP Report Provided	DOT&E	✓
Full-Rate Production Decision	MDA	

Table 5: Phase D Activities (Operations & Support)

Document / Activity	OPR	AFOTEC Involvement
Follow-On Buy Decision Conducted	SPO	
ESOH Risk Database Updated	SPO	
ILS/Sustainment Plan Refined/Completed	SPO	

Document / Activity	OPR	AFOTEC Involvement
NEPA documentation Updated	SPO	
Post Deployment Performance Review Conducted	SPO	
Required Periodic Reporting Products Produced	SPO	
Space Related System Build, Tested, and Deployed	SPO	
System Disposal Plan Completed	SPO	
System Internal & External Segment Synch Plan Implemented	SPO	

Section 5



Overview

The warfighting, acquisition, and T&E communities working together early and throughout a program's life cycle can enable early and on time fielding of warfighting capabilities. AFOTEC begins applying standardized methodologies for early influence prior to Milestone A by engaging in the Capabilities Based Assessment (CBA) process. The best opportunity to influence warfighting capabilities is when solutions are being analyzed. Through formal reviews of the early Joint Capabilities Integration and Development System (JCIDS) documents, such as the Initial Capabilities Document (ICD) and Capabilities Development Document (CDD), we have the opportunity to influence capabilities before a material solution, or mix of solutions, are selected.

By combining the OT&E professionals with the other acquisition process players early and often, we increase communication, coordination and enable increased teamwork. The result is fewer surprises in the later part of the acquisition process. Early and constant communication will ensure that documents and plans can be modified as necessary to keep pace with the changing world. By institutionalizing the early influence approach, we are helping to stress and refine requirements from a testability and measurability standpoint, in order to provide an effective, suitable, and mission capable warfighting capability. AFOTEC does not write the requirements for emerging capabilities, but we do refine the requirements from an operational vantage point.

Executing early influence may seem simple on the surface. However, in order to execute early influence effectively we have revamped our organization and processes to move beyond an era of mostly discussion and little action. Through early and continuous communication and coordination, the Air Force will benefit from high confidence OT&E planning with proven schedule and cost savings. Our goal is increased teamwork and decreased surprises at end game.

A convenient location to tabulate various points of contact for your test program is provided in Table 1. Table 2 is a place to capture the significant program events and the dates of the events.

The Space Operational Test and Evaluation Model (SOT&EM) Test Director's Toolkit (TDT) is meant to reflect a typical flow of a program within the Department of Defense (DoD) acquisition and the AFOTEC processes. Currently the DoD Space Interim Guidance is still in effect; some space programs have begun the transition to DoD Instruction (DoDI) 5000.02. However, test directors should follow the guidance used by the system program office. The TDT timeline (table 3) is not meant to portray each activity as a mandatory action. The timing of the TDT activities is not shown to scale. The references included in the TDT are not meant to be all-inclusive; the references provide a starting point to review the applicable policy and guidance. AFOTEC Instruction (AFOTECI) 99-101 is the directive for the basis of the processes outlined in the TDT. References to AFOTECM 99-101 will be added to the TDT concurrent with Manual publishing.

The checklists contain key actions as well as "Test Director (TD) Notes" pertaining to a specific acquisition or OT&E activity. A space is provided for each activity to track the status as the program matures. The information in this TDT is not to be construed as a substitute for the AFOTEC OT&E Guide; for each action in the checklist, the OT&E Guide should be consulted for additional guidance and procedures.

Table 1. Program Points of Contact

[illegible]

Table 2. Program Significant Events

Milestone/Decision	Date (Firm or Estimate)	Notes

Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Early Influence Strategy (EIS) (User, System Program Office (SPO), Operational Test Agency (OTA))</p> <p>MS A minus 36 mos</p> <p>Beginning early in the acquisition process, the acquisition community receives strategic guidance, or a description of the operational mission need. The acquisition community begins development of the initial Functional Solution Analysis or system concepts to address the operational mission need. During the pre-Milestone (MS)-A phase, the group responsible for building operational requirements forms the Integrated Concept Team (ICT). During the pre MS-A period, the Integrated Test (IT) community begins development of an Early Influence Strategy (EIS). The EIS tailors the generic space test and evaluation (T&E) model to the specifics of the program taking into consideration the required decisions, development, and testing activities. The early influence team (EIT) will review and influence early concepts, studies and initial JCIDS documents (i.e., the ICD), etc. for new space systems. AFOTEC will participate as a member of the EIT and will help develop the Integrated Test Team (ITT) charter, and serve as a co-chair upon formal stand-up of the ITT.</p> <p>STATUS: _____</p>	<p>References: National Security Space (NSS) Acquisition Policy Interim Guidance; Air Force Instruction (AFI) 99-103, Chapter 8; AFOTEC OT&E Guide, para 1.6; AFOTEC Operational Test (OT) of Information Assurance (IA) Guide; TDT Appendix 1, AFOTEC/CC ITEA Journal articles.</p> <p>Inputs: ICD, Analysis of Material Approaches (AMA) Course of Action (COA), Analysis of Alternatives (AOA) Study Plan (once developed-drafted)</p> <p>Key Actions:</p> <p>_____ Establish with SAF/AQ, initial SPO and Air Force Space Command (AFSPC)-initial concept team (ICT) an early influence team (EIT)</p> <p>_____ With EIT develop overarching strategy for executing early influence (EIS)</p> <p>_____ Review input documents as they become available</p> <p>TD Notes:</p> <p>- Use the AFOTEC/SMC,D.C. Liaison Office (LNO) and AFOTEC/A3O point of contact (POC) to assist in establishing initial contacts with SAF/AQ, Space and Missile Center (SMC) and AFSPC ICT.</p> <p>Outputs: draft ITT Charter (AFI 99-103, para, 4.4, AFOTEC OT&E Guide, para 4.10), EIS</p> <p>Points of Contact: AFOTEC/A3, Detachment (Det) lead (if available), AFOTEC/SMC LNO, D.C LNO.</p>
<p>Analysis of Material Approaches (AMA) (User)</p> <p>MS A minus 36 mos</p> <p>AFOTEC learns the results of the operational community's capabilities needs assessment of candidate material solutions as well as understanding the integrated architecture and metrics for the various materiel approaches. AFOTEC reviews for potential operational test strategies/ capabilities for future activities once involved in the program.</p> <p>STATUS: _____</p>	<p>References: AFI 10-601 paragraph (para) 3.3.2 and 4.3.1; AFI 63-101 para 1.5.1.3.</p> <p>Inputs: Previous capability reviews, previous needs analysis.</p> <p>Key Actions (Executed by AFOTEC/A3):</p> <p>_____ Look for consistency between gap and alternatives.</p> <p>_____ Add program to pre-involvement listing.</p> <p>TD Notes:</p> <p>- Pre-concept, pre-project; could be first hint of upcoming program.</p> <p>- Information and Resource Support System (IRSS) task only; notified thru AFOTEC Electronic Coordination System (AECS).</p> <p>Outputs: Program added to pre-involvement listing.</p> <p>Points of Contact: AFOTEC/A3.</p>

Early
Influence
Strategy

AMA

Timeline Legend: ● = User Product ● = SPO Product ● = ITT Product ● = AFOTEC Product

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>AFOTEC Involvement Determination (OTA)</p> <p>MS A minus 30 mos</p> <p>AFOTEC needs sufficient programmatic information to make an involvement determination. This information includes operational capability requirements, concept of operations, and the acquisition strategy.</p> <p>AFOTEC produces this package documenting the decision to be or not to be involved in the acquisition program as the OTA. Initial mission analysis and test infrastructure requirements are detailed to begin formal internal AFOTEC planning.</p> <p>STATUS: _____</p>	<p>References: Title 10, Sec 139 & 2399; DoDI 5000.02, para Encl 6.5.a; AFI 99-103, para 4.6; AFOTEC OT&E Guide, para 2.1 – 2.9; AFOTEC OT of IA Guide; TDT Appendix 1, AFOTEC/CC ITEA Journal articles.</p> <p>Inputs: Program information/notification (formal documents may not exist at this early point).</p> <p>Key Actions:</p> <p>_____ Collect program information to support involvement determination.</p> <p>_____ Assist with preparation of involvement package</p> <p>_____ Following determination, TD will establish contact with user, program office, and other stakeholders (e.g., AFOTEC LNO, Director Operational Test and Evaluation (DOT&E), etc).</p> <p>_____ Provide Program Manager's Operational Test Toolkit (PMOTT) to Program Manger (PM) and User.</p> <p>_____ Advise PM of readiness-to-test (RTT) process that will be employed (see TDT Topic 2).</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Program carried in pre-involvement by AFOTEC/A3 until sufficient information is collected to support the involvement determination. - Involvement letter can state non-involvement. - AFOTEC/CC approves all involvement decisions. - Formal appointment of test director. <p>Outputs: Involvement Letter, Tasking Order, Initial Test Resource Pan (TRP) Estimate, involvement brief on request (AFOTEC OT&E Guide, para 2.7 & 2.8).</p> <p>Points of Contact: AFOTEC/A3.</p>

**AFOTEC
Involvement
Determination**

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Capabilities Document High Performance Teams (HPT) (User)</p> <p>MS A minus 30 mos</p> <p>AFOTEC is invited to participate in the JCD/ICD HPT as a core team member to assist in developing capability requirements for a known mission capability gap.</p> <p>AFOTEC assists in the Joint Capabilities Integration and Development System (JCIDS) process to develop capabilities requirements documented in the JCD/ICD by contributing considerations such as soundness of operational capability requirements, the testability of those requirements, and offering a listing of potential operational capabilities (OC) needed to fill the identified capability gap.</p> <p>STATUS: _____</p>	<p>References: Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01; JCIDS Manual; DoD 5000.02; AFI 10-601, para 2.3.3; AFI 99-103; AF T&E Guidebook, Attachment (Atch) 3; AFOTEC OT&E Guide, para 2.4.</p> <p>Inputs: Involvement Determination, previous needs analysis, draft ICD (if available), HPT Schedule.</p> <p>Key Actions:</p> <p>_____ Review available documentation (draft ICD, needs analysis, etc) (AFOTEC/A3 ICD Review Checklist)</p> <p>_____ Develop HPT preparation material (evaluation summary worksheet (ESW)). (AFOTEC OT&E Guide, para 2.4)</p> <p>_____ Develop relationship with user.</p> <p>_____ Work with user to ensure AFOTEC is involved during future requirements development activities.</p> <p>_____ Ensure special interest items (IA, Interoperability, Electromagnetic Environmental Effects (E3), Global Positioning Satellite GPS) Signal Loss) are considered. (Defense Acquisition Guidebook (DAG), para 9.9, Air Force Manual (AFMAN) 63-119, AFOTEC OT&E Guide, para 1.14.2, AFOTEC OT of IA Guide).</p> <p>TD Notes:</p> <p>- Looking for complete, operationally relevant, and testable capabilities. (AFOTEC OT&E Guide, para 1.14.1.4)</p> <p>Outputs: Draft ICD to be staffed in IRSS for AFOTEC review.</p> <p>Points of Contact: AF/A5RD, Major Command (MAJCOM) (User).</p>
<p>Initial Capability Document (ICD) (User)</p> <p>MS A minus 24 mos</p> <p>AFOTEC is provided the opportunity to review the ICD and provide “operational tester” feedback. AFOTEC gains understanding of: 1) the gap/shortfall requiring a material solution; 2) the operational objectives or critical elements of the operation in the mission level context; and 3) the operational capabilities and key attributes the material solution must possess to satisfy the capability gap.</p> <p>AFOTEC provides feedback to the user to ensure the capability requirements reflect the needed operational capabilities. These capability requirements must be complete, operationally relevant, and testable.</p> <p>STATUS: _____</p>	<p>References: JCIDS Manual, Enclosure (Encl) F; DoD 5000.02, Encl 4; NSS Acquisition Policy Interim Guidance; DAG, para 9.1.2.1; AFI 10-601, Chapter 4; AFI 99-103, para 4.2; AFMAN 63-119, Atch 4; AFOTEC/A3 ICD Review Checklist; AFOTEC OT&E Guide, para 1.14.1.4.</p> <p>Inputs: draft ICD (via Information and Resource Support System (IRSS)), previous review checklist and ESW.</p> <p>Key Actions:</p> <p>_____ Confirm HPT inputs incorporated in ICD.</p> <p>_____ Ensure complete, operationally relevant, and testable capabilities via document review checklist.</p> <p>_____ Follow-up on submitted comments.</p> <p>TD Notes:</p> <p>- Document review checklist located on the AFOTEC-Intranet Template page.</p> <p>- AFOTEC/CC approves all comments prior to submission via IRSS.</p> <p>Outputs: ICD, AFOTEC early influence testability input.</p> <p>Points of Contact: AF/A5RD, MAJCOM (User), AFOTEC/A3</p>

HPT

ICD

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Concept Assessment Report (CAR) (OTA) MDD minus 1 mos</p> <p>As the ICT develops the functional solution analysis and the draft initial capabilities document (ICD), the IT community is involved in the early reviews of the proposed concepts in order to generate a concept assessment report. The report provides input to the materiel development decision, focused on the degree to which the system concept meets the mission needs stated in the strategic guidance.</p> <p>STATUS: _____</p>	<p>References: AFI 99-103, Chapter 8; AFOTEC OT&E Guide, para 1.6.3.</p> <p>Inputs: ICD, AMA</p> <p>Key Actions:</p> <p>_____ Confirm document from ICD and any changes</p> <p>_____ Ensure ICD has testable requirements</p> <p>_____ Identify any areas of concern for refining requirements</p> <p>TD Notes:</p> <p>- This report supports a concept decision, as described in current Space Acquisition Interim Guidance.</p> <p>Outputs: Concept Assessment Report</p> <p>Points of Contact: AFOTEC/A3, Det lead (if available), AFOTEC/SMC LNO, D.C LNO.</p>
<p>Acquisition Decision Memorandum (ADM) (SPO) MS A minus 14 mos</p> <p>AFOTEC needs to be cognizant of the decisions documented in the ADM in support of the Materiel Development Decision (MDD), to include direction to establish an integrated test team (ITT). Support and implement the OT activities (such as involvement decision, early influence, initial test planning, co-developing the ITT) required by the ADM.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, Encl 4; AFI 63-101, para 3.40; AFI 99-103; AFOTEC OT&E Guide, para 1.14.1.6.</p> <p>Inputs: ICD, MDD.</p> <p>Key Actions :</p> <p>_____ Verify accuracy of previous information (AFOTEC tasking order, ICD).</p> <p>_____ Coordinate ITT standup with SPO.</p> <p>_____ Determine need for T&E Strategy.</p> <p>TD Notes:</p> <p>- AFOTEC/CC coordinates on the ADM.</p> <p>Outputs: Milestone Decision Authority (MDA) decisions for entering the Materiel Solution Analysis phase, AFOTEC “Quad Chart” information.</p> <p>Points of Contact: Program Element Monitor (PEM).</p>

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Table 3. Space OT&E Model Activities

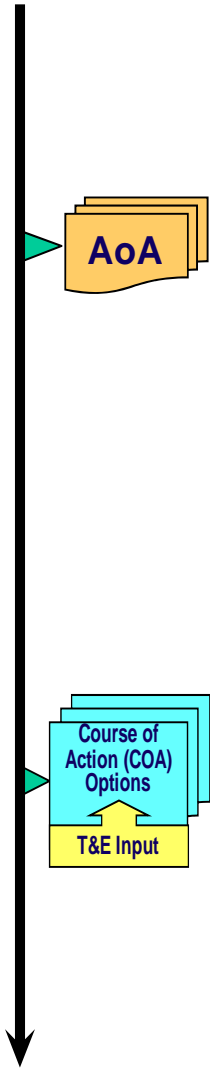
Programmatic Description	Test Director Actions
<p>Integrated Test Team (ITT) established/Charter developed (SPO/OTA)</p> <p>MS A minus 10 mos</p> <p>The SPO (Early Influence Team) initiates the stand-up of the ITT and associated charter for co-development with the ITT co-chair, AFOTEC. The charter should address required deliverables as well as the Readiness for OT&E certification process.</p> <p>As co-chair of the ITT, the operational test organization (AFOTEC if conducting OT&E) co-manages integrated test planning, execution, and reporting with the goal of integrating development testing and operational testing for increased efficiency. AFOTEC provides charter inputs on the OT strategy, OT roles and responsibilities, and integrated Development Test (DT)/T/OT (IDT/OT) products.</p> <p>STATUS: _____</p>	<p>References: AFI 63-101; AFI 99-103, paras 1.4, 3.14, 4.4, 8.4.3; AFMAN 63-119; AF T&E Guide Book, paras 6.2.1, 7.1.3, 7.2 and Atch 5; AFOTEC OT&E Guide, paras 1.6.1 1.8.1 4.10, and Atch A; AFOTEC-Intranet AFOTEC ITT Charter template.</p> <p>Inputs: ADM, ICD</p> <p>Key Actions:</p> <p>_____ Co-Chair ITT. (AFI 99-103, para 1.4, AFOTEC OT&E Guide, para 1.8.1)</p> <p>_____ Provide AFOTEC Mission Brief/Early Influence brief.</p> <p>_____ Prepare initial draft Charter input. (AFI 99-103, para, 4.4, AFOTEC OT&E Guide, para 4.10)</p> <p>_____ Prepare ITT POC List.</p> <p>_____ Coordinate with PM and readiness for OT&E certification official to establish readiness to test (RTT) review schedule and frequency for acquisition category (ACAT) I and II programs. (see TDT topic 2).</p> <p>_____ Ensure charter addresses IOT&E readiness and certification templates (AFMAN 63-119).</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - AFOTEC/CC signs charter. - Charter to be reviewed every 12 months and updated as required. <p>Outputs: Approved/Signed ITT Charter.</p> <p>Points of Contact: PM, Center Test Authority (CTA) representative, AF/TE, MAJCOM (<i>User/Operational Test Organization (OTO)</i>), AFOTEC/A3.</p>
<p>Concept of Operations (CONOPS) (User)</p> <p>MS A minus 10 mos</p> <p>The user develops a system CONOPS detailing the user/operator's concept for operations, maintenance and training associated with employing the system.</p> <p>AFOTEC ensures the system CONOPS is reflected in the OT&E and integrated test strategies, test design and planning, to include OT&E documents, so that the OT&E of the system is executed as the user/operator plans to employ the system in mission operations. System CONOPS may negate the need for certain threat/range testing previously planned.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02; DAG, Chapter 9; AFI 10-601; AFI 63-101; AFI 99-103; Air Force (AF) T&E Guidebook; AFOTEC OT&E Guide, para 1.14.1.7.</p> <p>Inputs: ICD, Concept Assessment Report.</p> <p>Key Actions:</p> <p>_____ Ensure ICD and T&E Strategy input trace to CONOPS.</p> <p>_____ Consider impact of CONOPS on tactics, techniques, and procedures.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - CONOPS should show system under test as it is intended to operate in the battlespace. <p>Outputs: User-approved CONOPS.</p> <p>Points of Contact: MAJCOM (<i>User</i>).</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Analysis of Alternatives (AoA) (User) MS A minus 9 mos</p> <p>AFOTEC is invited to participate on the AoA team providing an OT perspective to the AoA study plan.</p> <p>AFOTEC provides input to the AoA study plan in the form of potential critical operational issues (COI), measures of operational effectiveness/ suitability and associated criteria in support of the material and non-material alternatives being studied, to include the subsequent analysis and reporting.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4 and para Encl 7.5; DAG, Chapter 9; AFI 10-601, para 4.4.1; AFI 63-101, paras 1.5.1.4, 1.5.2.1; AFMAN 63-119, Atch 3; AFI 99-103; AF T&E Guidebook, para 4.3; AFOTEC OT&E Guide, para 1.14.1.1; AFOTEC/A3 AoA review checklist.</p> <p>Inputs: ICD, AoA Study Plan, ADM, AFOTEC Evaluation Summary Worksheet, ICD document review checklist.</p> <p>Key Actions:</p> <p>_____ Participate in the AoA Mission Effectiveness working group.</p> <p>_____ Provide potential OT&E information to AoA team.</p> <p>TD Notes:</p> <p>- Knowledge gained from the AoA efforts can serve to develop an initial integrated and OT strategy.</p> <p>Outputs: Approved AoA, AFOTEC early influence input on ops relevancy.</p> <p>Points of Contact: Office of Aerospace Studies, MAJCOM, SPO, ITT.</p>
<p>Course of Action (COA) (SPO/User) MS A minus 8 mos</p> <p>AFOTEC needs to understand the program selected from the alternative choices the MAJCOM and the milestone decision authority (MDA) (or designee) have agreed to.</p> <p>AFOTEC, thru the ITT, provides preliminary OT strategy from an initial test design for the MAJCOM selected alternative. This preliminary OT strategy serves as an input to the T&E Strategy required prior to the milestone (MS) A decision.</p> <p>STATUS: _____</p>	<p>References: AFI 63-101, para 3.36; AFI 10-601; AFI 99-103; AF T&E Guidebook, para 5.5; AFOTEC OT&E Guide, para 1.14.1.2.</p> <p>Inputs: ICD, AoA,</p> <p>Key Actions:</p> <p>_____ Provide high-level OT Strategy for each COA option.</p> <p>_____ Capture MAJCOM issues for use in OT test design.</p> <p>_____ Consider establishment of a "requirements board" or a single user POC for requirements where there are multiple users.</p> <p>TD Notes:</p> <p>- Be aware of MAJCOM issues with selected option.</p> <p>Outputs: Selected COA, AFOTEC preliminary IDT/OT and OT strategy, AFOTEC "Quad Chart" update.</p> <p>Points of Contact: MAJCOM, Program Office.</p>



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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Capabilities Document High Performance Teams (HPT) (User)</p> <p>MS A minus 8 mos</p> <p>AFOTEC is invited to participate in the initial CDD HPT as a core team member to assist in developing capability requirements for a known mission capability gap.</p> <p>AFOTEC assists in the Joint Capabilities Integration and Development System (JCIDS) process to develop capabilities requirements documented in the initial CDD by contributing considerations such as soundness of operational capability requirements, the testability of those requirements, and offering a listing of potential operational capabilities (OC) needed to fill the identified capability gap.</p> <p>STATUS: _____</p>	<p>References: CJCSI 3170.01; JCIDS Manual; DoD 5000.02; AFI 10-601, para 2.3.3; AFI 99-103; AF T&E Guidebook, Atch 3; AFOTEC OT&E Guide, para 2.4.</p> <p>Inputs: draft initial CDD (if available), HPT Schedule, ITD, draft Test and Evaluation Strategy (TES).</p> <p>Key Actions:</p> <p>_____ Review available documentation (draft CDD, ITD, TES, etc). (AFOTEC/A3 CDD Review Checklist)</p> <p>_____ Ensure mandatory Key Performance Parameters (KPP)/Key System Attributes (KSA) are considered. (CJCSI 3170.01, para Encl B.3.)</p> <p>_____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) are considered. (Defense Acquisition Guidebook (DAG), para 9.9, AFMAN 63-119, AFOTEC OT&E Guide, para 1.14.2, AFOTEC OT of IA Guide)</p> <p>_____ If CDD HPT is first program activity, see actions for ICD and test design</p> <p>TD Notes:</p> <p>- Looking for complete, operationally relevant, and testable requirements. (AFOTEC OT&E Guide, para 1.14.1.4)</p> <p>Outputs: Draft CDD to be staffed in IRSS, AFOTEC OT construct, integrating KPPs/KSAs.</p> <p>Points of Contact: AF/A5RD, AFSPC (<i>User</i>).</p>

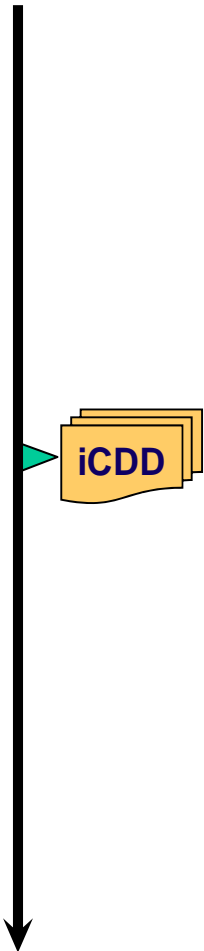
HPT

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Initial Capabilities Development Document (iCDD) (User)</p> <p>MS A minus 8 mos</p> <p>AFOTEC is provided the opportunity to review the initial CDD (iCDD) (service approval) and provide “operational tester” feedback. AFOTEC gains understanding of: 1) the gap/shortfall requiring a material solution; 2) the operational objectives or critical elements of the operation in the mission level context; and 3) the operational capabilities and key attributes the material solution must possess to satisfy the capability gap.</p> <p>AFOTEC provides feedback to the user to ensure the capability requirements reflect the needed operational capabilities. These capability requirements must be complete, operationally relevant, and testable.</p> <p>STATUS: _____</p>	<p>References: JCIDS Manual, Encl G; NSS Acq Policy Interim Guidance; DAG, para 9.1.2.2; AFI 10-601, Chapter 5; AFI 99-103, para 5.12 and Chapter 8; AFMAN 63-119, Atch 4; AFOTEC/A3 CDD Review Checklist; AFOTEC OT&E Guide, paras 1.6 and 1.14.1.4.</p> <p>Inputs: draft CDD (via IRSS), previous review checklist and ESC, ITD, TES, TRP.</p> <p>Key Actions:</p> <p>_____ Confirm HPT inputs incorporated in iCDD.</p> <p>_____ Ensure complete, operationally relevant, and testable requirements via document review checklist.</p> <p>_____ Follow-up on submitted comments.</p> <p>_____ Cross-check capability requirements with intended enabling concept of operations.</p> <p>_____ Ensure mandatory KPP/KSA are considered. (CJCSI 3170.01, para Encl B.3.)</p> <p>_____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) are considered. (Defense Acquisition Guidebook (DAG), para 9.9, AFMAN 63-119, AFOTEC OT&E Guide, para 1.14.2, AFOTEC OT of IA Guide)</p> <p>_____ Review comments submitted to ICD for incorporation.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Document review checklist located on the AFOTEC-Intranet Template page. - AFOTEC/CC approves all comments prior to submission via IRSS. <p>Outputs: iCDD, AFOTEC testability input on KPP, KSA and other system requirements.</p> <p>Points of Contact: AFSPC(<i>User</i>) .</p>



Timeline Legend: = User Product = SPO Product = ITT Product = AFOTEC Product

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Initial Test Design (ITD) (<i>OTA</i>)</p> <p>MS A minus 7 mos</p> <p>Initial test design is another focus of Early Influence. It is a systematic approach to take the test teams from capability requirements to credible OT&E constructs which, when executed, will yield the final data required by decision-makers to make program decisions. The ITD provides a foundation for technical adequacy and rationale for the OT program based on the use of design of experiments fundamentals. The ITD fleshes out and documents the details that are known during the Early Influence phase in order to build a solid basis for a test approach and to communicate that approach with others. The test approach is developed by identifying the operational conditions and testing constraints, thereby leading to a set of test events. Further discussion leads to a basis of estimate and identifying resources (test articles, personnel, etc.), determining execution methodologies (field test, mod/sim, etc.), identifying test capability requirements and shortfalls, and refining the OT activities and schedule (Operational Utility Evaluation (OUE), Operational Assessment (OA), OT&E, or combinations) plus level of involvement.</p> <p>STATUS: _____</p>	<p>References: DAG, paras 9.1.4, 9.4, 9.8.2; Memorandum of Assessment (MOA) on MOT&E; AFI 99-103, Chapter 4; AF T&E Guidebook, Chapter 6 – 8 and para 10.1; AFOTEC PAM 99-104; AFOTEC OT&E Guide, Chapter 2 – 4; AFOTEC OT of IA Guide; TDT Topic 1, Design of Experiments (DOE), TDT Topic 3, Implementing the Dec 2007 Section 231 Report.</p> <p>Inputs: ICD, AoA, COA, ADM, (if available: CONOPs, System Threat Assessment Report (STAR), Acq Strategy), Evaluation Summary Worksheet (ESW).</p> <p>Key Actions:</p> <p>_____ Develop: Initial test design products (Evaluation View, draft evaluation summary chart, draft test event matrix) (with A3 and A2A9). (AFOTEC OT&E Guide Chapter 2)</p> <p>_____ Review Lessons Learned</p> <p>_____ Conduct test design meeting with core team.</p> <p>_____ Clarify any ambiguous requirements with user.</p> <p>_____ Look for opportunities to include integrated DT/OT into design.</p> <p>_____ Consider opportunities to accomplish comparison testing (comparison to legacy system).</p> <p>_____ Ensure information assurance requirements are included in the (contact A6O and Det IA POC, if assigned).</p> <p>_____ Include modeling & simulation and test capability requirements.</p> <p>_____ Consider multiservice implications.</p> <p>_____ Finalize test design products.</p> <p>TD Notes:</p> <p>- DOE information in Topic 1 is a must read before starting ITD.</p> <p>Outputs: initial test design, updated test resource plan, tasking order update.</p> <p>Points of Contact: Core Team members, ITT.</p>
<p>Technology Development Strategy (TDS) (<i>SPO</i>)</p> <p>MS A minus 7 mos</p> <p>AFOTEC gains insight on the approach to technology development using demonstrations or prototypes so the user and developer can determine if the proposed mature technology solution is affordable and militarily useful.</p> <p>AFOTEC provides early influence input to the proposed demonstrations and prototypes for operational test relevance and possible integrated test events.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4 and para Encl 5.c; DAG, Chapter 2; AFI 63-101, para 3.43; AF T&E Guidebook, para 5.6.</p> <p>Inputs: ICD, AoA, COA, ITD.</p> <p>Key Actions:</p> <p>_____ Look for opportunities for integrating with technology demonstrations.</p> <p>_____ Provide early influence operational insight to technology development activities.</p> <p>TD Notes:</p> <p>- AFOTEC provides early influence input.</p> <p>Outputs: ITD validation and update.</p> <p>Points of Contact: Program manager, ITT.</p>

Initial Test Design

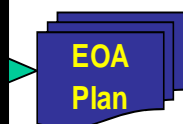
TDS

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Early Operational Assessment (EOA) Plan (OTA)</p> <p>MS A minus 7 mos</p> <p>AFOTEC requires sufficient programmatic information to develop the OT&E EOA Plan. This information will include: operational capability requirements, acquisition strategy, developmental test activities, and concept of operations.</p> <p>This is an AFOTEC-produced document outlining the OTA's plan for assessing the progress toward operational effectiveness, suitability, and mission capability of the system being acquired as well as assessing the readiness of the system for the planned Initial OT&E (IOT&E).</p> <p>STATUS: _____</p>	<p>References: DoDI, 5000.02, para Encl 2 6.d.14; AFI 99-103, para 2.6.9 and Chapter 8; AFOTEC OT&E Guide, paras 1.6, 4.12.3 - 4.12.4 and Atch A; AFMAN 63-119.</p> <p>Inputs: draft iCDD, draft TES, ITD, EOA Plan Template, initial TRP.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for EOA plan.</p> <p>_____ Ensure latest EOA plan template is used.</p> <p>_____ See latest signed EOA plan for reference.</p> <p>_____ Coordinate EOA Plan with ITT to develop an integrated DT/OT approach, if developed.</p> <p>_____ Coordinate EOA plan for AFOTEC/CC approval. (AFOTEC OT&E Guide, Atch A)</p> <p>_____ If program on oversight, ensure DOT&E approves adequacy.</p> <p>TD Notes:</p> <p>- Template "lock-down" for the EOA plan, the point where the test team does not have to update the EOA plan format to a new template version, is Technical Review (TR) 2 or six months prior to start test if TR 2 not accomplished.</p> <p>Outputs: Approved EOA plan.</p> <p>Points of Contact: Test Team, Core Team members, ITT.</p>
<p>Execute EOA</p> <p>EOA Start</p> <p>OAs are conducted to provide insight into progress being made toward operational effectiveness, suitability, and mission capability. The OT&E construct will form the basis for an operational assessment. The construct used for the OA may not be the final construct, but it should give insight into the elements that make up effectiveness and suitability for the system under test. OAs also look into the program's future based on current information and observations to assess readiness for OT&E. OAs consist of two areas: progress toward operational capabilities, and progress towards readiness for OT&E. OA activities provide the information for assessing each area. These activities can include contractor or developer test events, program and documentation reviews, modeling and simulation, studies and analysis, testing by other agencies, etc.</p> <p>STATUS: _____</p>	<p>References: AFI 99-103, para 2.6.9 and Chapter 8; AFOTEC OT&E Guide, paras 1.6, 4.12.3 - 4.12.4 and Chapter 5; AFMAN 63-119.</p> <p>Inputs: EOA Plan.</p> <p>Key Actions:</p> <p>_____ Conduct final preparation actions prior to EOA start.</p> <p>_____ Execute deployment checklist, if applicable. (AFOTEC OT&E Guide, para 5.3)</p> <p>_____ Execute EOA procedures.</p> <p>_____ Conduct, as required, appropriate EOA execution reporting.</p> <p>TD Notes:</p> <p>- Become familiar with all reporting requirements during EOA execution.</p> <p>- Become familiar with information release restrictions.</p> <p>- Understand AFOTEC/CC's policy on communicating with SPO during test execution (see OT&E Guide paragraph 5.2).</p> <p>- An EOA is a "snapshot in time" of the system; the system typically will not have completed development..</p> <p>Outputs: Data, appropriate EOA execution reports.</p> <p>Points of Contact: A3, AFOTEC/SE.</p>



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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Test and Evaluation Strategy (TES) (SPO/Responsible Test Organization (RTO)/CTA/OTA)</p> <p>MS A minus 7 mos</p> <p>The SPO, using the ITT, initiates the description of the overall T&E strategy for the selected solution, providing the developmental test (DT) strategy and the program management concept of an integrated test strategy.</p> <p>AFOTEC develops the OT strategy and reviews the DT strategy to co-develop with the SPO an integrated test strategy, including modeling and simulation. TES inputs provide the first iteration of the test and evaluation master plan (TEMP) for the program.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4 and para Encl 6.2.a; DAG, para 9.6.1 (format); AFI 99-103, paras 4.11 and 8.4.4; AF T&E Guidebook, para 5.7; AFOTEC OT&E Guide, para 1.14.3 and Atch A; AFOTEC/A3 TES review checklist.</p> <p>Inputs: ICD, AoA, COA, ITD, TRP.</p> <p>Key Actions:</p> <p>_____ Use ITD to build OT section of TES.</p> <p>_____ Use TRP to build resource section of TES.</p> <p>_____ Maximize integrated DT/OT opportunities.</p> <p>_____ Consider multiservice implications (inputs, resources) for MOT&Es. (MOA for Multiservice OT&Es (MOT&E), AFOTEC OT&E Guide, Atch A)</p> <p>_____ Ensure appropriate early integrated DT/OT verbiage included.</p> <p>_____ Ensure information assurance testing requirements are documented.</p> <p>_____ Include modeling & simulation and test capability requirement.</p> <p>TD Notes:</p> <p>- TES content expectations are in the DAG.</p> <p>Outputs: TES, IDT/OT and dedicated OT strategy.</p> <p>Points of Contact: Program office, ITT, Core Team members.</p>
<p>Modeling and Simulation (M&S) Support Plan (MSSP) (SPO)</p> <p>MS A minus 7 mos</p> <p>This document provides AFOTEC: 1) Information on the integrated use of M&S within program planning activities and across functional disciplines, 2) opportunity to review M&S requirements and development (or use) strategy, and 3) opportunity to review and participate in planned M&S verification and validation activities.</p> <p>AFOTEC provides early influence review and input of M&S requirements. Provide M&S resource requirements for OT&E and advise about the development and Verification, Validation & Accreditation (VV&A) of M&S resources.</p> <p>STATUS: _____</p>	<p>References: AFI 16-1002; AFMAN 63-119 Atch 18; AFOTEC OT&E Guide, para 1.14.1.10.</p> <p>Inputs: ITD, draft TES, draft TDS, TRP.</p> <p>Key Actions:</p> <p>_____ Maximize integrated DT/OT opportunities.</p> <p>_____ Ensure AFOTEC M&S requirements are known and included.</p> <p>_____ Look for opportunities to use DT M&S tools where appropriate.</p> <p>_____ Ensure compliance with AFOTEC and Air Force VV&A requirements for all M&S.</p> <p>_____ Ensure MSSP is consistent with TES.</p> <p>TD Notes:</p> <p>- M&S requirements are provided to the SPO to be included in SPO funding.</p> <p>Outputs: MSSP, initial AFOTEC M&S strategy.</p> <p>Points of Contact: SPO M&S Working Group, ITT.</p>

TES

MSSP

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Life Cycle Management Plan (LCMP) (SPO/OTA)</p> <p>MS A minus 7 mos</p> <p>This document provides AFOTEC: 1) information on the integrated acquisition and sustainment strategy for the life of the proposed material solution, and 2) opportunity to review the required T&E summary (or TEMP level of information if TEMP is not expected to be required).</p> <p>AFOTEC provides early influence review and input for operational test relevant considerations. Review required T&E summary information from the OT and integrated perspectives (TEMP-like information if TEMP is not expected to be required).</p> <p>STATUS: _____</p>	<p>References: AFI 63-101, para 3.39; AF LCMP Guide; AFMAN 63-119, Atch 9; AFI 99-103, para 5.13; AFOTEC PAM 99-104; AFOTEC OT&E Guide, 1.14.5.</p> <p>Inputs: ITD, draft TES, draft TDS, TRP.</p> <p>Key Actions:</p> <p>_____ Ensure consistency with ICD support concept.</p> <p>_____ Use LCMP to validate and update ITD.</p> <p>TD Notes:</p> <p>- AFOTEC provides early influence input.</p> <p>Outputs: LCMP, initial AFOTEC sustainment OT strategy.</p> <p>Points of Contact: SPO, MAJCOM (<i>User</i>).</p>
<p>Information Support Plan (ISP) (SPO)</p> <p>MS A minus 7 mos</p> <p>AFOTEC gains familiarity with the SPO's identification and documentation of information needs, infrastructure and intelligence support, information technology and National Security Systems interface requirements, and net-centric, interoperability, supportability and sufficiency concerns. Ensure the required net-ready key performance parameter (NR-KPP) and DOT&E special interest items (SII) centered on information assurance, interoperability and electromagnetic environmental effects (E³) are considered by the SPO and included as part of the overall T&E strategy for the proposed material solution.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, Table 3; DAG, Chapter 7; AFI 63-101, para 3.67; AFMAN 63-119, Atch 10; AFI 99-103; AF T&E Guidebook, para 5.4; AFOTEC OT&E Guide, para 1.14.1.11; AFOTEC OT of IA Guide.</p> <p>Inputs: ITD, draft TES, draft TDS, TRP, ICD.</p> <p>Key Actions:</p> <p>_____ Maximize integrated DT/OT opportunities.</p> <p>_____ Ensure consistency with ICD information assurance concept.</p> <p>_____ Use ISP to validate and update ITD.</p> <p>_____ Ensure SPO considers coordination with Air Force Information Operations Center (AFIOC) or other approved IA test agency.</p> <p>TD Notes:</p> <p>- AFOTEC reviews and coordinates the ISP.</p> <p>Outputs: ISP, initial AFOTEC IA & net-ready OT strategy.</p> <p>Points of Contact: SPO, MAJCOM (<i>User</i>).</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Early Operational Assessment (EOA) Report (OTA)</p> <p>MS A minus 45 days (or as negotiated)</p> <p>AFOTEC expects access to the system and associated documentation in order to execute the EOA.</p> <p>The results of the EOA are documented in an AFOTEC EOA report. This report will assess the progress toward operational effectiveness, suitability, and mission capability, assessing the COIs, and assessing the system's readiness for dedicated IOT&E. The report is provided in sufficient time to support the milestone decision.</p> <p>STATUS: _____</p>	<p>References: AFI 99-103, Chapter 8; AFOTEC OT&E Guide, para's 1.6, 6.3, and Atch A; AFMAN 63-119.</p> <p>Inputs: EOA Plan, TES, EOA data.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for EOA Report.</p> <p>_____ Share EOA observations with user/SPO to ensure understanding and facilitate deficiency corrective actions.</p> <p>_____ Ensure any observed deficiencies are entered into the deficiency reporting system.</p> <p>_____ Coordinate EOA Report for AFOTEC/CC approval.</p> <p>_____ Capture lessons learned for future IOT&E planning.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Don't share final conclusions prior to AFOTEC/CC approval. - Refer to the current AFOTEC-Intranet OA final report template. Template "lock-down" for the OA final report, the point where the test team does not have to update the final report format to a new template version, is 30 days prior to OA start. <p>Outputs: Approved EOA Report, lessons learned input, deficiency reports.</p> <p>Points of Contact: Test Team, Core Team members</p>
<p>Integrated Program Summary (IPS) (SPO)</p> <p>MS A minus 30 days</p> <p>Prior to each space system Defense Acquisition Board (DAB), the DoD Space MDA will convene an Independent Program Assessment Team (IPAT) to advise him on a program's readiness to advance into the next acquisition phase. The IPAT's findings and recommendations are presented to the DoD Space MDA at the DAB and the Build Approval. In preparation for the Independent Program Assessment (IPA), the System Program Director (SPD)/Program Manager (PM) produces a consolidated set of program documentation, known as an Integrated Program Summary (IPS), to facilitate the IPAT review.</p> <p>STATUS: _____</p>	<p>References: NSS Acquisition Policy Interim Guidance.</p> <p>Inputs: EOA Report</p> <p>Key Actions:</p> <p>_____ Facilitate report and findings with SPO and MAJCOM</p> <p>_____ Monitor SPO and MAJCOM reply and concerns</p> <p>_____ Elevate actions to leadership</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Be sure to coordinate any concerns IAW procedures in OT&E Guide. <p>Outputs: IPS inputs</p> <p>Points of Contact: AFSPC/SMC (SPO)</p>



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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Acquisition Decision Memorandum (ADM) (SPO)</p> <p>MS B minus 18 mos</p> <p>AFOTEC needs to be cognizant of the decisions documented in the ADM in support of the Milestone A. Support and implement the OT activities (such as involvement decision, early influence, initial test planning, co-developing the ITT) required by the ADM.</p> <p>STATUS: _____</p>	<p>References: AFI 63-101, para 3.40.</p> <p>Inputs: ICD, MS A.</p> <p>Key Actions :</p> <p>_____ Verify accuracy of previous information (AFOTEC tasking order, ICD).</p> <p>_____ Coordinate ITT standup with SPO.</p> <p>_____ Determine need for T&E Strategy.</p> <p>TD Notes:</p> <p>- AFOTEC/CC coordinates on the ADM.</p> <p>Outputs: MDA decisions for entering the Technology Development Phase, AFOTEC “Quad Chart” information.</p> <p>Points of Contact: PEM.</p>
<p>Capabilities Document High Performance Teams (HPT) (User)</p> <p>MS B minus 18 mos</p> <p>AFOTEC is invited to participate in the CDD HPT as a core team member to assist in developing capability requirements for a known mission capability gap.</p> <p>AFOTEC assists in the JCIDS process to develop capabilities requirements documented in the CDD by contributing considerations such as completeness, relevance, soundness of operational capability requirements, and the testability of those requirements.</p> <p>STATUS: _____</p>	<p>References: CJCSI 3170.01; JCIDS Manual; DoD 5000.02; AFI 10-601, para 2.3.3; AFI 99-103; AF T&E Guidebook, Atch 3; AFOTEC OT&E Guide, para 2.4.</p> <p>Inputs: draft CDD (if available), HPT Schedule, ITD, TES.</p> <p>Key Actions:</p> <p>_____ Review available documentation (draft CDD, ITD, TES, etc). (AFOTEC/A3 CDD Review Checklist)</p> <p>_____ Ensure mandatory KPP/KSA are considered. (CJCSI 3170.01, para Encl B.3.)</p> <p>_____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) are considered. (Defense Acquisition Guidebook (DAG), para 9.9, AFMAN 63-119, AFOTEC OT&E Guide, para 1.14.2, AFOTEC OT of IA Guide)</p> <p>_____ If CDD HPT is first program activity, see actions for ICD and test design.</p> <p>TD Notes:</p> <p>- Looking for complete, operationally relevant, and testable requirements. (AFOTEC OT&E Guide, para 1.14.1.4)</p> <p>Outputs: Draft CDD to be staffed in IRSS, AFOTEC OT construct integrating KPPs/KSAs.</p> <p>Points of Contact: AF/A5RD, MAJCOM (User).</p>


ADM

HPT

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<div data-bbox="110 699 289 800">  </div> <p>Capability Development Document (CDD) (User)</p> <p>MS B minus 12 mos</p> <p>AFOTEC is provided the opportunity to review the CDD (for space systems- first Joint Requirements Oversight Council (JROC) approval) and provide “operational tester” feedback. Gain understanding of the required KPPs and key system attributes (KSA) in relation to operational capability critical operational issues, performance operational measures and associated criteria expressed by thresholds and objectives.</p> <p>AFOTEC provides feedback to ensure the capability requirements reflect the needed operational capabilities. These capability requirements must be complete, operationally relevant, and testable. Feedback discovered during early influence activities is provided to the HPT.</p> <p>STATUS: _____</p>	<p>References: JCIDS Manual, Encl G; DoDI 5000.02, Encl 4; NSS Acq Policy Interim Guidance; DAG, para 9.1.2.2; AFI 10-601, Chapter 5; AFI 99-103, para 5.12 and Chapter 8; AFMAN 63-119, Atch 4; AFOTEC/A3 CDD Review Checklist; AFOTEC OT&E Guide, para 1.14.1.4.</p> <p>Inputs: draft CDD (via IRSS), previous review checklist and evaluation summary chart (ESC), ITD, TES, TRP.</p> <p>Key Actions:</p> <p>_____ Coordinate access to document on IRSS and staffing with A3</p> <p>_____ Confirm HPT inputs incorporated in CDD.</p> <p>_____ Ensure complete, operationally relevant, and testable requirements via document review checklist.</p> <p>_____ Ensure mandatory KPP/KSA are considered. (CJCSI 3170.01, para Encl B.3.)</p> <p>_____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) are considered. (Defense Acquisition Guidebook (DAG), para 9.9, AFMAN 63-119, AFOTEC OT&E Guide, para 1.14.2, AFOTEC OT of IA Guide)</p> <p>_____ Review comments submitted to ICD for incorporation.</p> <p>_____ Follow-up on submitted comments.</p> <p>_____ Cross-check capability requirements with intended enabling concept of operations</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Document review checklist located on the AFOTEC-Intranet Template page. - AFOTEC/CC approves all comments prior to submission via IRSS. - CDD may require updating previous test design, initial test plan, and TRP. Test design validation activities are described in OT&E Guide. - Test plans, to include TEMP parts III and IV inputs, are developed using the CDD. <p>Outputs: CDD, AFOTEC testability input on KPP, KSA and other system requirements.</p> <p>Points of Contact: MAJCOM (User).</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Integrated Test Design (RTO/OTA)</p> <p>MS B minus 8 mos</p> <p>The SPO develops detailed and feasible developmental test design, objectives and known test requirements that can be used by the ITT to develop an integrated DT/OT concept for execution by the developers and OTA, along with populating the TEMP.</p> <p>AFOTEC develops a feasible operational test construct and initial operational test plan consisting of COIs, measures, events, scenarios, scope/ methodology, limitations, test capabilities and test resources that can be implemented by the ITT into an integrated test concept and TEMP.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 6; DAG, para 9.1.4; AFI 99-103, Chapter 4 – 6; AF T&E Guidebook, Chapter 6 – 8; AFOTEC OT&E Guide, paras 1.6, 1.8, and Chapter 2 – 4; TDT Topic 1, Design of Experiments, TDT Topic 3, Implementing the December 2007 Section 231 Report.</p> <p>Inputs: CDD (draft), ITD, TES.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Review ITD with integrated test team. _____ Review developmental test planning activities conducted by program office. _____ Establish contact with Responsible Test Organization (RTO); notify them of intent to integrate, to the maximum extent possible, the OT events into DT events. _____ Validate test capability requirements; look for opportunities to share resources. _____ Validate initial test design using CDD (via core team if desired). _____ Remind program office of AFMAN 63-119 requirements and expectations. _____ Prepare appropriate range documentation (Program Introduction Document (PID)), as necessary. _____ Document planned savings (\$, time, test assets) in the test resource plan (TRP) <p>TD Notes:</p> <ul style="list-style-type: none"> - Not intended to be a product; meant to be a process by which OT and DT designs come together. <p>Outputs: TEMP inputs with integrated events; information for future test plan development.</p> <p>Points of Contact: Core Team and ITT members.</p>

Integrated Test Design

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Early Operational Assessment (EOA) Plan (OTA)</p> <p>MS B minus 7 mos</p> <p>AFOTEC requires sufficient programmatic information to develop the OT&E EOA Plan. This information will include: operational capability requirements, acquisition strategy, developmental test activities, and concept of operations.</p> <p>This is an AFOTEC-produced document outlining the OTA's plan for assessing the progress toward operational effectiveness, suitability, and mission capability of the system being acquired as well as assessing the readiness of the system for the planned IOT&E.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, para Encl 2 6.d.14; AFI 99-103, para 2.6.9 and Chapter 8; AFOTEC OT&E Guide, paras 1.6, and 4.12.3 - 4.12.4; AFMAN 63-119.</p> <p>Inputs: draft CDD or draft iCDD, draft TES, ITD, EOA Plan Template, initial TRP.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for EOA plan.</p> <p>_____ Review lessons learned</p> <p>_____ Ensure latest plan template is used.</p> <p>_____ See latest signed EOA plan for reference.</p> <p>_____ Coordinate EOA Plan with ITT to develop an integrated DT/OT approach, if developed.</p> <p>_____ Coordinate EOA plan for AFOTEC/CC approval. (AFOTEC OT&E Guide, Atch A)</p> <p>_____ If program on oversight, ensure DOT&E approves adequacy.</p> <p>TD Notes:</p> <p>- Template "lock-down" for the EOA plan, the point where the test team does not have to update the EOA plan format to a new template version, is Technical Review (TR) 2 or six months prior to start test if TR 2 not accomplished.</p> <p>Outputs: Approved EOA plan.</p> <p>Points of Contact: Test Team, Core Team members, ITT.</p>
<p>Execute EOA</p> <p>EOA Start</p> <p>OAs are conducted to provide insight into progress being made toward operational effectiveness, suitability, and mission capability. The OT&E construct will form the basis for an operational assessment. The construct used for the OA may not be the final construct, but it should give insight into the elements that make up effectiveness and suitability for the system under test. OAs also look into the program's future based on current information and observations to assess readiness for OT&E. OAs consist of two areas: progress toward operational capabilities, and progress towards readiness for OT&E. OA activities provide the information for assessing each area. These activities can include contractor or developer test events, program and documentation reviews, modeling and simulation, studies and analysis, testing by other agencies, etc.</p> <p>STATUS: _____</p>	<p>References: AFI 99-103, para, 2.6.9 and Chapter 8; AFOTEC OT&E Guide, paras 1.6, and 4.12.3 - 4.12.4; AFMAN 63-119.</p> <p>Inputs: EOA Plan.</p> <p>Key Actions:</p> <p>_____ Conduct final preparation actions prior to EOA start.</p> <p>_____ Execute deployment checklist, if applicable. (AFOTEC OT&E Guide, para 5.3)</p> <p>_____ Execute EOA procedures.</p> <p>_____ Conduct, as required, appropriate EOA execution reporting.</p> <p>TD Notes:</p> <p>- Become familiar with all reporting requirements during EOA execution.</p> <p>- Become familiar with information release restrictions.</p> <p>- Understand AFOTEC/CC's policy on communicating with SPO during test execution (see OT&E Guide paragraph 5.2).</p> <p>- An EOA is a "snapshot in time" of the system; the system typically will not have completed development.</p> <p>Outputs: Data, appropriate EOA execution reports.</p> <p>Points of Contact: A3, AFOTEC/SE.</p>

EOA Plan

Execute EOA

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Test and Evaluation Master Plan (TEMP) (SPO/RTO/OTA)</p> <p>MS B minus 6 mos</p> <p>The SPO, using the ITT and starting with the TES, initiates the development of the TEMP by recording: the critical technical parameters; integrated master test schedule (to include but not limited to acquisition milestones, development schedule, integrated DT/OT, and OT activities); T&E management responsibilities; detailed DT strategy and objectives; dedicated OT&E readiness entrance and exit criteria; and final T&E resources. SPO support to the AFOTEC initial test design work is desired by providing system development and developmental testing (DT) expertise.</p> <p>AFOTEC provides input to Part III integrated DT/OT and OT test events. AFOTEC develops Part III OT&E details based on initial test design/planning which include: 1) COIs; 2) TEMP measure summary reflecting the CDD; 3) OT&E events with configuration description, objectives, scenarios, scope, methodology integrated test opportunities, and limitations; and 4) entrance criteria for starting dedicated IOT&E. AFOTEC provides input to Part IV OT&E resources include funding, manpower, and test articles/ capabilities, including modeling and simulation. In order to ensure future testing adequacy, limitations to threat representation must be addressed, as this feeds into the Foreign Materiel Program. The TEMP is one of the formal methods to document threat limitations which are seen by external agencies.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4, and Encl 6.2.b; DAG, paras 9.6.2 and 9.10 (format); AFI 99-103, paras 5.14 and 8.5.3; AF T&E Guidebook para 5.8; AFOTEC OT&E Guide, para 1.14.4.</p> <p>Inputs: CDD (draft*), ITD, TRP, Enabling CONOPs, ADM, draft TEMP sections 1 and 2.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Use ITD to build OT section of TEMP. _____ Use TRP to build resource section of TEMP. _____ Maximize integrated DT/OT opportunities throughout TEMP. _____ Consider multiservice implications (inputs, resources) for MOT&Es. (MOA for MOT&Es, AFOTEC OT&E Guide, Atch A) _____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) modeling & simulation and test capability requirements are incorporated. (Defense Acquisition Guidebook (DAG), para 9.9, AFMAN 63-119, AFOTEC OT&E Guide, para 1.14.2, AFOTEC OT of IA Guide) _____ Ensure system readiness for OT&E certification requirements and the readiness-to-test (RTT) review process are addressed. (see TDT topic 2). _____ Ensure appropriate fidelity of OT activities (e.g., OAs, IOT&E, etc). _____ Ensure executable program schedule. _____ Follow-up on submitted comments. <p>TD Notes:</p> <ul style="list-style-type: none"> - If program on Office of the Secretary of Defense (OSD) oversight, be aware of additional interaction and coordination activities (see OT&E guide, paragraph 1.14.6). (AFOTEC OT&E guide, paragraph 1.14.6) - Document review checklist located on the AFOTEC-Intranet Template page. - *TEMP and CDD may be prepared in parallel; use draft CDD if necessary. <p>Outputs: TEMP with IDT/OT and dedicated OT&E construct, scope and methodology, and resources.</p> <p>Points of Contact: Program office, Core Team members, ITT.</p>

TEMP

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Modeling and Simulation Support Plan (MSSP) (SPO)</p> <p>MS B minus 6 mos</p> <p>This document provides AFOTEC updated: 1) Information on the integrated use of M&S within program planning activities and across functional disciplines, 2) opportunity to review M&S requirements and development (or use) strategy, and 3) opportunity to review and participate in planned M&S verification and validation activities.</p> <p>AFOTEC provides input of M&S requirements based on initial test design. Provide M&S resource requirements for OT&E and advise about the development and VV&A of M&S resources.</p> <p>STATUS: _____</p>	<p>References: AFI 16-1002; AFMAN 63-119, Atch 18; AFOTEC OT&E Guide, para 1.14.1.10.</p> <p>Inputs: ITD, TEMP, TRP, CDD (draft).</p> <p>Key Actions:</p> <p>_____ Maximize integrated DT/OT opportunities.</p> <p>_____ Ensure AFOTEC M&S requirements are known and included (i.e., operational ground rules and assumptions, accreditation process).</p> <p>_____ Look for opportunities to use DT M&S tools where appropriate.</p> <p>_____ Look for opportunities to include distributed simulation.</p> <p>_____ Ensure MSSP is consistent with TEMP.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - M&S requirements provided to SPO to be included in SPO funding. - M&S development and VV&A are potential long-lead items. - All models and sims planned to be used in OT&E require AFOTEC accreditation. <p>Outputs: MSSP, validated AFOTEC M&S strategy.</p> <p>Points of Contact: SPO M&S working group, ITT, AFOTEC/A9.</p>
<p>LCMP Update (SPO)</p> <p>MS B minus 6 mos</p> <p>This document provides AFOTEC: 1) updated information on the integrated acquisition and sustainment strategy for the life of the proposed material solution, and 2) opportunity to review the required T&E summary (or TEMP level of information if TEMP is not expected to be required).</p> <p>AFOTEC provides review and input for OT-relevant considerations. Review and input on the required T&E summary information from the OT and integrated test perspectives (TEMP-like information if TEMP is not expected to be required).</p> <p>STATUS: _____</p>	<p>References: AFI 63-101, para 3.39; AF LCMP Guide; AFMAN 63-119, Atch 9; AFI 99-103, para 5.13; AFOTEC PAM 99-104; AFOTEC OT&E Guide, 1.14.5.</p> <p>Inputs: ITD, draft TEMP, TRP, CDD, CONOPs.</p> <p>Key Actions:</p> <p>_____ Ensure consistency with CDD.</p> <p>_____ Ensure consistency with acquisition program baseline (APB).</p> <p>_____ Review for sustainability considerations.</p> <p>_____ Update (as necessary) the initial test design.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - If program does not require a TEMP, LCMP will contain TEMP-like information. <p>Outputs: LCMP, validated AFOTEC sustainment OT construct.</p> <p>Points of Contact: SPO, MAJCOM (User).</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>AoA Update (if applicable) (<i>User</i>) MS B minus 6 mos</p> <p>This document provides AFOTEC updates to the AoA as a result of technology development phase efforts, if applicable.</p> <p>AFOTEC provides input to the updated AoA including updated OT&E construct, which includes COIs, measures of operational effectiveness/ suitability and associated criteria, resulting from early influence and EOA activities.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4 and para Encl 7.5; DAG, Chapter 9; AFI 10-601, para 4.4.1; AFI 63-101, paras 1.5.1.4 and 1.5.2.1; AFMAN 63-119, Atch 3; AFI 99-103; AF T&E Guidebook, para 4.3; AFOTEC OT&E Guide, para 1.14.1.1; AFOTEC/A3 AoA review checklist.</p> <p>Inputs: CDD, Previous AoA, ADM, ITD, TEMP.</p> <p>Key Actions:</p> <p>_____ Participate in the AoA Mission Effectiveness working group.</p> <p>_____ Provide potential OT&E information to AoA team.</p> <p>TD Notes:</p> <p>- Document review checklist located on the AFOTEC-Intranet Template page.</p> <p>Outputs: Approved AoA, AFOTEC input on operational construct.</p> <p>Points of Contact: Office of Aerospace Studies, MAJCOM.</p>
<p>ITT Charter Update (<i>ITT</i>) MS B minus 6 mos</p> <p>The SPO updates the ITT charter with applicable impacts resulting from the technology development phase efforts.</p> <p>As co-chair of the ITT, AFOTEC provides charter updates on the OT strategy, OT roles and responsibilities and integrated DT/OT products resulting from early influence and EOA activities.</p> <p>STATUS: _____</p>	<p>References: AFI 63-101; AFI 99-103, paras 1.4, 3.14, 4.4, and 8.4.3; AFMAN 63-119; AF T&E Guidebook, paras 6.2.1, 7.1.3, 7.2 and Atch 5; AFOTEC OT&E Guide, paras 1.6.1, 1.8.1 and 4.10; AFOTEC-Intranet AFOTEC ITT Charter template.</p> <p>Inputs: Previous ITT Charter.</p> <p>Key Actions:</p> <p>_____ Determine any updates to AFOTEC role on ITT.</p> <p>_____ Prepare Charter updates. (AFI 99-103, para, 4.4, AFOTEC OT&E Guide, para 4.10)</p> <p>_____ Update ITT POC List.</p> <p>_____ Remind program office of AFMAN 63-119 requirements and expectations.</p> <p>_____ If not previously accomplished for ACAT I and II programs, coordinate with program manger (PM) and readiness for OT&E certification official to establish readiness to test (RTT) review schedule and frequency. (see TDT topic 2).</p> <p>TD Notes:</p> <p>- AFOTEC/CC signs charter.</p> <p>- Charter to be reviewed every 12 months and updated as required.</p> <p>Outputs: Approved/Signed ITT Charter.</p> <p>Points of Contact: ITT members, AFOTEC/A3.</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Information Support Plan (ISP) Update (SPO)</p> <p>MS B minus 6 mos</p> <p>AFOTEC gains familiarity with the SPO's identification and documentation of information needs, infrastructure and intelligence support, information technology and National Security Systems interface requirements, and net-centric, interoperability, supportability and sufficiency concerns derived from the technology development phase results. AFOTEC reviews and coordinates the ISP.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, Table 3; DAG, Chapter 7; AFI 63-101, para 3.67; AFMAN 63-119, Atch 10; AFI 99-103; AF T&E Guidebook, para 5.4; AFOTEC OT&E Guide, para 1.14.1.11; AFOTEC OT for IA Guide.</p> <p>Inputs: ITD, TEMP, TRP, CDD, previous ISP.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Maximize integrated DT/OT opportunities. _____ Ensure consistency with CDD information assurance concept. _____ Ensure the required NR-KPP and DOT&E special interest items (SII) centered on information assurance, interoperability and E³ are considered and implemented by the SPO. _____ Consult with AFOTEC/A6 as needed. _____ Ensure SPO considers coordination with AFIOC or other approved IA test agency. <p>TD Notes:</p> <ul style="list-style-type: none"> - OT&E of IA Guide located on the AFOTEC-Intranet. <p>Outputs: ISP, validated IA and net-ready OT construct.</p> <p>Points of Contact: SPO, MAJCOM (<i>User</i>).</p>
<p>Deficiency Reporting (DR) (SPO/User)</p> <p>MS B minus 6 mos</p> <p>The SPO establishes and administers a deficiency reporting (DR) process according to Technical Order (TO) 00-35D-54, <i>USAF Deficiency Reporting and Investigating System</i> and AFI 63-501, <i>Air Force Acquisition Quality Program</i>.</p> <p>AFOTEC will use and participate in the DR process throughout all phases of OT, early influence, initial test planning, test planning, execution and reporting.</p> <p>STATUS: _____</p>	<p>References: MOA on MOT&E para 3.e; AFI 63-101, para 2.29.25; AFMAN 63-119; AFI 99-103, paras 5.17, and 6.10; AF T&E Guidebook, Chapter 13; Deficiency Reporting Technical Order (TO) 00-35D-54; AFOTEC PAM 99-104, Chapter 14; AFOTEC OT&E Guide, para 4.15.</p> <p>Inputs: TEMP, ITT Charter, ITD.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Ensure deficiency reporting and tracking process is established by program office. _____ Establish AFOTEC role in deficiency reporting process. _____ For MOT&E, identify deficiency reporting system to be used. <p>TD Notes:</p> <ul style="list-style-type: none"> - Don't under estimate importance of getting involved in the DR process early. - Deficiency process includes several boards that the TD is a member of (Joint Reliability and Maintainability Evaluation Team (JRMET), Deficiency Review Board (DRB), Test Data Scoring Board (TDSB), Materiel Improvement Program Review Board (MIPRB)). (AFI 63-101, para 4.47.3.2.2; AFMAN 63-119, Atch 20; AFI 99-103, para 6.9; AF T&E Guidebook, para 7.5; AFOTEC PAM 99-104, Chapter 13; AFOTEC OT&E Guide, para 5.11 and 5.12.) - Typically, the JRMET and TDSB have charters laying out roles and responsibilities. (AFOTEC Pamphlet (AFOTEC PAM) 99-104, para 13.6; AFOTEC OT&E Guide, para's 5.11 and 5.12) <p>Outputs: Documented DR process.</p> <p>Points of Contact: ITT, AFOTEC/A3</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Program Management Directive (PMD) (SAF/AQ PEM)</p> <p>MS B minus 6 mos</p> <p>As co-chair of the ITT, the SPO receives the PMD which provides official HQ USAF documentation and direction for the Air Force program of record determined at the MS B decision, conveys the guidance and direction of the decision authority, identifies the various organizations along with their essential responsibility and provides direction for the associated T&E activities.</p> <p>As the ITT co-chair, AFOTEC provides results from a review of the PMD to ensure government operational test organizations are in compliance and their key responsibilities are correctly identified to ensure fully integrated testing with the development testing community.</p> <p>STATUS: _____</p>	<p>References: Air Staff HOI 63-1; AFI 63-101, para 3.37; AFMAN 63-119, Atch 2; AFI 99-103, para 5.18; AF T&E Guidebook, para 5.3; AFOTEC/A3 PMD Review checklist; AFOTEC OT&E Guide, para 1.14.1.3.</p> <p>Inputs: ADM.</p> <p>Key Actions:</p> <p>_____ Ensure PMD is consistent with Tasking Order.</p> <p>_____ Ensure operational testing is properly characterized.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Document review checklist located on the AFOTEC-Intranet Template page. - A PMD establishes a formal acquisition program. - A PMD is directive on the Air Force only. - An MOA can further define responsibilities. TDs need to document relationships/responsibilities with other organizations as soon as requirements are known. Coordination among all the agencies can be time consuming. <p>Outputs: PMD, AFOTEC “Quad Chart” update.</p> <p>Points of Contact: SAF/AQ PEM.</p>
<p>System Threat Assessment (STA) or System Threat Assessment Report (STAR) (SPO)</p> <p>MS B minus 6 mos</p> <p>The validated STA/STAR provides the test/acquisition community with validated, current threat analysis specific to the system under test. In the case where no STA/STAR is available, the appropriate Capstone Threat Assessments (CTA) provides similar information for a broader category of system.</p> <p>AFOTEC uses the STA/STAR/CTA as a guide to develop threat lists, coordinate the expected threat environment with range personnel to plan range costing, and to state limitations to threat testing.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4, Table 3; NSS Acquisition Policy Interim Guidance; DAG Chapter 8, para 8.2.1.2, Chapter 9, para’s 9.6.2.1 and 9.10 (TEMP format, Part I); AFMAN 63-119, Atch 5; AFOTEC OT&E Guide, para 1.14.1.5.</p> <p>Inputs: CDD, previous threat assessments, CONOPs, ISP.</p> <p>Key Actions:</p> <p>_____ Ensure ITD addresses current threats documented in STA/STAR.</p> <p>_____ Provide inputs to SPO on STAR content such as clarity of threats, realism of threats, etc.</p> <p>_____ Ensure requirements reflect current threat.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Acquisition Category (ACAT) I programs use STARs; ACAT II programs use STAs; ACAT III programs use Capstone Threat Assessments - Automated Information System (AIS) programs, regardless of ACAT designation, may use the Information Operations Capstone Threat Assessment - Programs on DOT&E Oversight require a STAR regardless of ACAT designation - If the STAR has expired then the program should use the applicable Capstone Threat Assessment - If STA/STAR is older than one year, look for virtual STAR (vSTAR) information; contact AFOTEC/A2. <p>Outputs: STA/STAR, AFOTEC threat test capabilities requirements, threat scenarios and events.</p> <p>Points of Contact: SPO intelligence rep and threat working group, ITT, AFOTEC/A2S.</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Request for Proposal (RFP) (SPO) MS B minus 6 mos</p> <p>The SPO provides a draft RFP and statement of work (SOW) supporting the TES, contractor support to DT/OT, a common T&E data base and DR system.</p> <p>AFOTEC reviews requirements and provides feedback concerning developing contractor support to such items as the OT strategy and concept, specific integrated logistics support requirements if implemented by the program's concept of operations, the deficiency reporting process, a common T&E data base, and system modeling and simulation requirements.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, para Encl 2 6.c. (4); AFI 63-101, para 3.16.3; AFMAN 63-119, Atch 32; AFI 99-103; AFOTEC OT&E Guide, para 1.14.1.9.</p> <p>Inputs: TEMP, CDD, ITD.</p> <p>Key Actions:</p> <p>_____ Ensure integrated DT/OT is addressed.</p> <p>_____ Ensure accessibility to T&E data.</p> <p>_____ Ensure deficiency reporting, tracking, and scoring is addressed.</p> <p>_____ Ensure Information Assurance T&E is addressed.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Integrated DT/OT requirements assist with awareness of eventual OT needs. - Visibility into contractor deficiencies will facilitate operational assessments. - Monitor changes to the RFP that are made after initial release prior to contract award. <p>Outputs: Final RFP.</p> <p>Points of Contact: ITT, PM.</p>
<p>Security Classification Guide (SCG) (SPO/User) MS B minus 6 mos</p> <p>A SPO-developed guide that informs T&E planners of the proper classification of all data associated with the system under test. Ensure that all aspects of operational and integrated test planning and documentation accurately classify all the appropriate testing data for security of the system.</p> <p>There is no direct OT&E contribution to this document.</p> <p>STATUS: _____</p>	<p>References: DAG Chapter 8, para 8.4.6.5; AFMAN 63-119, Atch 13; AFOTEC OT&E Guide, para 1.14.1.8.</p> <p>Inputs: CDD, ISP, LCMP, TEMP.</p> <p>Key Actions:</p> <p>_____ Read and understand primary and related system SCGs.</p> <p>_____ Ensure test plan is in accordance with SCG.</p> <p>_____ Look for multi-level security and multi-national requirements.</p> <p>_____ For MOT&Es, ensure sister service OTAs understand SCG requirements.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - All team members need to understand SCG to avoid security violations. - If an automated information system (AIS) program does not have an SCG, the default is DoDI 0-3600.02, "Information Operations Security Classification Guide". <p>Outputs: Properly classified IDT/OT and dedicated OT construct.</p> <p>Points of Contact: AFOTEC/CVS, PM.</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Environmental Safety and Occupational Health (ESOH) (SPO)</p> <p>MS B minus 6 mos</p> <p>This SPO-developed document provides AFOTEC support strategy containing programmatic, environmental, safety, and health evaluation (PESHE) document summarizing: ESOH risks, strategy for integrating ESOH considerations into systems engineering process; method for tracking progress; completion schedule for National Environmental Policy Act (NEPA); Operational Safety, Suitability, and Effectiveness (OSS&E) strategy.</p> <p>AFOTEC performs an initial evaluation of safety aspects of T&E plans prior to commencement of test activities via Safety Review Board (SRB). Ensure strategy is in place to identify/mitigate health and safety hazards. Determine if humans are to be used as test subjects and evaluate anticipated level of risk.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, para Encl 12.6; DAG, Chapter 4, para 4.4.7 and Chapter 9, para 9.9.7; NSS Acq Policy Interim Guidance para Topic 1.1.8; AFI 63-101, paras 3.16.6, 3.49, and 3.77; AFI 63-1201, Atch 4; AFMAN 63-119, Atch 25; AF LCMP Guide; AFOTEC PAM 99-104, Chapter 7; AFOTEC OT&E Guide, para 4.12.1.6.</p> <p>Inputs: CDD, TEMP.</p> <p>Key Actions:</p> <p>_____ Coordinate with Detachment/SE early.</p> <p>_____ Participate in ESOH process.</p> <p>_____ Ensure strategy is in place to identify/mitigate health and safety hazards.</p> <p>TD Notes:</p> <p>- ESOH actions need to be complete prior to TRR.</p> <p>Outputs: Environmentally sound, safe and healthy IDT/OT and OT plans.</p> <p>Points of Contact: AFOTEC/SE.</p>
<p>Early Operational Assessment (EOA) Report (OTA)</p> <p>MS B minus 45 days (or as negotiated)</p> <p>AFOTEC expects access to the system and associated documentation in order to execute the EOA.</p> <p>The results of the EOA are documented in an AFOTEC EOA report. This report will assess the progress toward operational effectiveness, suitability, and mission capability, assessing the COIs, and assessing the system's readiness for dedicated IOT&E. The report is provided in sufficient time to support the milestone decision.</p> <p>STATUS: _____</p>	<p>References: AFI 99-103, Chapter 8; AFOTEC OT&E Guide, paras 1.6, 6.3, and Atch A; AFMAN 63-119.</p> <p>Inputs: EOA Plan, TES, EOA data.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for EOA Report.</p> <p>_____ Share EOA observations with user/SPO to ensure understanding and facilitate deficiency corrective actions.</p> <p>_____ Ensure any observed deficiencies are entered into the deficiency reporting system.</p> <p>_____ Coordinate EOA Report for AFOTEC/CC approval.</p> <p>_____ Capture lessons learned for future IOT&E planning.</p> <p>TD Notes:</p> <p>- Don't share final conclusions prior to AFOTEC/CC approval.</p> <p>- Refer to the current AFOTEC-Intranet OA final report template. Template "lock-down" for the OA final report, the point where the test team does not have to update the final report format to a new template version, is 30 days prior to OA start.</p> <p>Outputs: Approved EOA Report, lessons learned input, deficiency reports.</p> <p>Points of Contact: Test Team, Core Team members, ITT</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Integrated Program Summary (IPS) (SPO)</p> <p>MS B minus 30 days</p> <p>Prior to each space system DAB, the DoD Space MDA will convene an Independent Program Assessment Team (IPAT) to advise him on a program's readiness to advance into the next acquisition phase. The IPAT's findings and recommendations are presented to the DoD Space MDA at the DAB and the Build Approval. In preparation for the IPA, the SPD/PM produces a consolidated set of program documentation, known as an Integrated Program Summary (IPS), to facilitate the IPAT review.</p> <p>STATUS: _____</p>	<p>References: NSS Acquisition Policy Interim Guidance.</p> <p>Inputs: EOA Report</p> <p>Key Actions:</p> <p>_____ Facilitate report and findings with SPO and MAJCOM</p> <p>_____ Monitor SPO and MAJCOM reply and concerns</p> <p>_____ Elevate actions to leadership</p> <p>TD Notes:</p> <p>- Be sure to coordinate any concerns IAW procedures in OT&E Guide.</p> <p>Outputs: IPS inputs</p> <p>Points of Contact: AFSPC/SMC (SPO)</p>
<p>Acquisition Decision Memorandum (ADM) (SPO)</p> <p>MS C minus 18 mos</p> <p>AFOTEC needs to be cognizant of the decisions documented in the ADM in support of the Milestone B. Support and implement the OT activities (such as involvement decision, early influence, initial test planning, co-developing the ITT) required by the ADM.</p> <p>STATUS: _____</p>	<p>References: AFI 63-101, para 3.40.</p> <p>Inputs: CDD, MS B.</p> <p>Key Actions:</p> <p>_____ Verify accuracy of previous information (AFOTEC tasking order, CDD).</p> <p>_____ Coordinate ITT standup with SPO.</p> <p>_____ Determine need for T&E Strategy.</p> <p>TD Notes:</p> <p>- AFOTEC/CC coordinates on the ADM.</p> <p>Outputs: MDA decisions for entering the Engineering and Manufacturing Development Phase, AFOTEC "Quad Chart" information.</p> <p>Points of Contact: PEM.</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Capabilities Document High Performance Teams (HPT) (User)</p> <p>MS C minus 18 mos</p> <p>AFOTEC is invited to participate in the CDD (second Joint Requirements Oversight Council (JROC) approval) HPT as a core team member to assist in developing capability requirements for a known mission capability gap.</p> <p>AFOTEC assists in the JCIDS process to develop capabilities requirements documented in the CDD by contributing considerations such as completeness, relevance, soundness of operational capability requirements, and the testability of those requirements.</p> <p>STATUS: _____</p>	<p>References: CJCSI 3170.01; JCIDS Manual; DoD 5000.02; AFI 10-601, para 2.3.3; AFI 99-103; AF T&E Guidebook, Atch 3; AFOTEC OT&E Guide, para 2.4.</p> <p>Inputs: draft CDD (if available), HPT Schedule, test concept, TEMP. (AFOTEC/A3 CDD Review Checklist)</p> <p>Key Actions:</p> <p>_____ Review available documentation (draft CDD, test concept, TEMP, etc).</p> <p>_____ Ensure mandatory KPP/KSA are considered. (CJCSI 3170.01, para Encl B.3.)</p> <p>_____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) are considered. (Defense Acquisition Guidebook (DAG), para 9.9; AFMAN 63-119; AFOTEC OT&E Guide, para 1.14.2; AFOTEC OT of IA Guide)</p> <p>TD Notes:</p> <p>- Looking for complete, operationally relevant, and testable requirements. (AFOTEC OT&E Guide, para 1.14.1.4)</p> <p>Outputs: Draft CDD to be staffed in IRSS</p> <p>Points of Contact: AF/A5RD, AFSPC (<i>User</i>).</p>

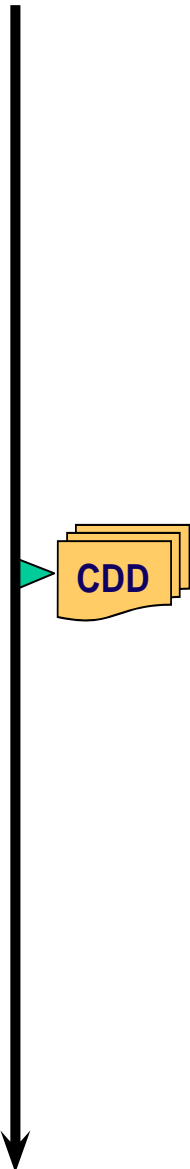
HPT

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Capabilities Development Document (CDD) (User)</p> <p>MS C minus 12 mos</p> <p>AFOTEC is provided the opportunity to review the CDD (this is the second JROC CDD) and provide “operational tester” feedback. Gain understanding of the finalized required KPPs and KSA in relation to operational capability critical operational issues, performance operational measures and associated criteria expressed by thresholds and objectives.</p> <p>AFOTEC provides feedback to ensure the capability requirements reflect the needed operational capabilities. These capability requirements must be complete, operationally relevant, and testable. Feedback discovered during test planning activities including any conducted OA to determine progress towards capability performance is provided. Initial test design and plans, to include TEMP Part IV inputs, are developed using the CDD.</p> <p>STATUS: _____</p>	<p>References: JCIDS Manual Encl G; DoD 5000.02; NSS Acq Policy Interim Guidance; DAG, para 9.1.2.2; AFI 10-601, Chapter 5; AFI 99-103, para 5.12 and Chapter 8; AFMAN 63-119, Atch 4; AFOTEC/A3 CDD Review Checklist; AFOTEC OT&E Guide, para 1.14.1.4.</p> <p>Inputs: draft CDD (via IRSS), previous review checklist and ESC, test concept, TEMP, TRP.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Coordinate access to document on IRSS and staffing with A3 _____ Confirm HPT inputs incorporated in CDD. _____ Ensure complete, operationally relevant, and testable requirements via document review checklist. _____ Ensure mandatory KPP/KSA are considered. (CJCSI 3170.01, para Encl B.3.) _____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) are considered. (Defense Acquisition Guidebook (DAG), para 9.9; AFMAN 63-119; AFOTEC OT&E Guide, para 1.14.2; AFOTEC OT of IA Guide) _____ Review comments submitted to CDD for incorporation. _____ Follow-up on submitted comments. _____ Cross-check capability requirements with intended enabling concept of operations. <p>TD Notes:</p> <ul style="list-style-type: none"> - Document review checklist located on the AFOTEC-Intranet Template page. - AFOTEC/CC approves all comments prior to submission via IRSS. - CDD may require updating previous test design, initial test plan, and TRP. Test design validation activities are described in OT&E Guide. - Test plans, to include TEMP parts III and IV inputs, are developed using the CDD. <p>Outputs: CDD, AFOTEC testability input on KPP, KSA and other system requirements.</p> <p>Points of Contact: AFSPC (<i>User</i>).</p>



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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Concept of Operations (CONOPS) (if not previously developed) (<i>User</i>)</p> <p>MS C minus 12 mos</p> <p>The user develops a system CONOPS detailing the user/operator's concept for operations, maintenance and training associated with employing the system.</p> <p>AFOTEC ensures the system CONOPS is reflected in the OT&E and integrated test strategies, test design and planning, to include OT&E documents, so that the OT&E of the system is executed as the user/operator plans to employ the system in mission operations. System CONOPS may negate the need for certain threat/range testing previously planned.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02; DAG, Chapter 9, AFI 10-601; AFI 63-101; AFI 99-103; AF T&E Guidebook; AFOTEC OT&E Guide, para 1.14.1.7.</p> <p>Inputs: CDD (draft CPD), TEMP, ISP, test concept.</p> <p>Key Actions:</p> <p>_____ Review and ensure test concept is updated as necessary.</p> <p>_____ Ensure CDD and CPD trace to CONOPS.</p> <p>_____ Consider impact of CONOPS on tactics, techniques, and procedures.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - CONOPS should address system under test as it is intended to operate in the battlespace. <p>Outputs: User-approved CONOPS, AFOTEC IDT/OT and OT construct based on validated operations of new system.</p> <p>Points of Contact: MAJCOM (<i>User</i>).</p>
<p>PMD Update (PEM)</p> <p>MS C minus 12 mos</p> <p>As co-chair of the ITT, the SPO receives an updated PMD.</p> <p>As the ITT co-chair, AFOTEC provides results from a review of the PMD to ensure government operational test organizations are in compliance and their key responsibilities are correctly identified to ensure fully integrated testing with the development testing community based on early influence activities.</p> <p>STATUS: _____</p>	<p>References: Air Staff HOI 63-1; AFI 63-101, para 3.37; AFMAN 63-119, Atch 2; AFI 99-103, para 5.18; AF T&E Guidebook, para 5.3; AFOTEC/A3 PMD Review checklist; AFOTEC OT&E Guide, para 1.14.1.3.</p> <p>Inputs: ADM, Previous PMD.</p> <p>Key Actions:</p> <p>_____ Ensure PMD is consistent with Tasking Order.</p> <p>_____ Ensure operational testing is properly characterized.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Document review checklist located on the AFOTEC-Intranet Template page. - A PMD is directive on the Air Force only. - An MOA can further define responsibilities. <p>Outputs: PMD, AFOTEC "Quad Chart" update.</p> <p>Points of Contact: SAF/AQ PEM.</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Integrated Test Concept (SPO/RTO/OTA)</p> <p>MS C minus 12 mos</p> <p>The SPO refines the initial developmental test design so it can be used by the ITT to develop an executable integrated test (combined DT/OT) concept and plan for execution by the developers and OTA, along with updating the TEMP.</p> <p>AFOTEC provides an executable OT construct and updated initial test plan consisting of COIs, measures/identified standards with criteria, events, scenarios, scope/methodology, limitations, test capabilities, and test resources that can be implemented by the ITT into an executable integrated test concept and used to update the TEMP.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 6; DAG, para 9.1.4; AFI 99-103, Chapter 4 – 6; AF T&E Guidebook, Chapter 6 – 8; AFOTEC OT&E Guide, paras 1.6, 1.8, and Chapter 3 – 4, TDT Topic 1, Design of Experiments, TDT Topic 3, Implementing the Dec 2007 Section 231 Report.</p> <p>Inputs: TEMP.</p> <p>Key Actions:</p> <p>_____ Coordinate identified standards with user and developer.</p> <p>_____ Communicate measures with ITT.</p> <p>_____ Collaborate with A9 on measure development.</p> <p>_____ Ensure technical review (TR #1) of measures is accomplished.</p> <p>_____ Initiate activities to formally establish and stand-up the test team (if not previously accomplished).</p> <p>_____ Document planned savings (\$, time, test assets) in the test resource plan (TRP)</p> <p>TD Notes:</p> <p>- Integrated Test Concept is the merging of the DT concept and OT concept to form IDT/OT.</p> <p>Outputs: Integrated Test Concept, Updated tasking order.</p> <p>Points of Contact: Test Team, ITT.</p>
<p>System Threat Assessment (STA) or System Threat Assessment Report (STAR) (SPO)</p> <p>MS C minus 6 mos</p> <p>The validated STA/STAR provides the test/acquisition community with validated, current threat analysis specific to the system under test. In the case where no STA/STAR is available, the appropriate Capstone Threat Assessments (CTA) provides similar information for a broader category of system.</p> <p>AFOTEC uses the STA/STAR/CTA as a guide to develop threat lists, coordinate the expected threat environment with range personnel to plan range costing, and to state limitations to threat testing.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4, Table 3; NSS Acquisition Policy Interim Guidance; DAG Chapter 8, para 8.2.1.2 and Chapter 9, para's 9.6.2.1 and 9.10 (TEMP format, Part I); AFMAN 63-119, Atch 5; AFOTEC OT&E Guide, para 1.14.1.5.</p> <p>Inputs: CDD, previous threat assessments, CONOPs, ISP.</p> <p>Key Actions:</p> <p>_____ Ensure test concept addresses current threats documented in STA/STAR.</p> <p>_____ Provide inputs to SPO on STAR content such as clarity of threats, realism of threats, etc.</p> <p>_____ Ensure requirements reflect current threat.</p> <p>TD Notes:</p> <p>- ACAT I programs use STARs; ACAT II programs use STAs; ACAT III programs use Capstone Threat Assessments</p> <p>- AIS programs, regardless of ACAT designation, may use the Information Operations Capstone Threat Assessment</p> <p>- Programs on DOT&E Oversight require a STAR regardless of ACAT designation</p> <p>- If the STAR has expired then the program should use the applicable Capstone Threat Assessment</p> <p>- If STA/STAR is older than one year, look for vSTAR information; contact AFOTEC/A2.</p> <p>Outputs: STA/STAR, AFOTEC threat test capabilities requirements, threat scenarios and events.</p> <p>Points of Contact: SPO intelligence rep and threat working group, ITT, AFOTEC/A2S.</p>

Integrated Test Concept

STA

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Modeling and Simulation Support Plan (MSSP) (SPO)</p> <p>MS C minus 6 mos</p> <p>This document provides AFOTEC updated: 1) Information on the integrated use of M&S within program planning activities and across functional disciplines, 2) opportunity to review M&S requirements and development (or use) strategy, and 3) opportunity to review and participate in planned M&S verification and validation activities.</p> <p>AFOTEC uses the verification and validation plans and resulting information developed for the planned models and simulations to produce an independent accreditation plan and report.</p> <p>STATUS: _____</p>	<p>References: AFI 16-1002; AFMAN 63-119, Atch 18; AFOTEC OT&E Guide, para 1.14.1.10.</p> <p>Inputs: Test concept, TEMP, TRP, CDD (draft CPD),</p> <p>Key Actions:</p> <p>_____ Maximize integrated DT/OT opportunities.</p> <p>_____ Ensure AFOTEC M&S requirements are known and included (i.e., operational ground rules and assumptions, accreditation process).</p> <p>_____ Look for opportunities to use DT M&S tools where appropriate.</p> <p>_____ Look for opportunities to include distributed simulation.</p> <p>_____ Ensure MSSP is consistent with TEMP.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - M&S requirements provided to SPO to be included in SPO funding. - M&S development and VV&A are potential long-lead items. - All models and simulations planned to be used in OT&E require AFOTEC accreditation. <p>Outputs: MSSP, validated AFOTEC M&S strategy.</p> <p>Points of Contact: SPO M&S working group, ITT, AFOTEC/A9.</p>
<p>LCMP Update (SPO)</p> <p>MS C minus 6 mos</p> <p>This document provides 1) updated information on the integrated acquisition and sustainment strategy for the life of the proposed material solution, and 2) opportunity to review the required T&E summary (or TEMP level of information if TEMP is not expected to be required).</p> <p>AFOTEC review and provides input for OT-relevant considerations. Review and input on the required T&E summary information from the OT and integrated test perspectives (TEMP like information if TEMP is not expected to be required).</p> <p>STATUS: _____</p>	<p>References: AFI 63-101, para 3.39; AF LCMP Guide; AFMAN 63-119, Atch 9; AFI 99-103, para 5.13; AFOTEC PAM 99-104; AFOTEC OT&E Guide, 1.14.5.</p> <p>Inputs: Test Concept, draft TEMP, TRP, CDD (draft CPD), CONOPs.</p> <p>Key Actions:</p> <p>_____ Ensure consistency with CDD.</p> <p>_____ Ensure consistency with acquisition program baseline (APB).</p> <p>_____ Review for sustainability considerations.</p> <p>_____ Update (as necessary) the test concept.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - If program does not require a TEMP, LCMP will contain TEMP-like information. <p>Outputs: LCMP, validated AFOTEC sustainment OT construct.</p> <p>Points of Contact: SPO, MAJCOM (<i>User</i>).</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>OA Plan (OTA) MS C minus 6 mos AFOTEC requires sufficient programmatic information to develop the OT&E OA Plan. This information includes: operational capability requirements, acquisition strategy, developmental test activities, and concept of operations.</p> <p>This is an AFOTEC-produced document outlining the OTA's plan for assessing the progress toward operational effectiveness, suitability, and mission capability of the system being acquired as well as assessing the readiness of the system for the planned IOT&E.</p> <p>STATUS: _____</p>	<p>References: DoDI, 5000.02, para Encl 2 6.d.14; AFI 99-103, para 2.6.9 and Chapter 8; AFOTEC OT&E Guide, paras 1.6 and 4.12.3 - 4.12.4; AFMAN 63-119.</p> <p>Inputs: CDD (draft CPD), TEMP, test concept, OA Plan Template, TRP.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for OA plan.</p> <p>_____ Review lessons learned</p> <p>_____ Ensure latest plan template is used.</p> <p>_____ See latest signed OA plan for reference.</p> <p>_____ Conduct technical review #2. (AFOTEC OT&E Guide, para 4.4)</p> <p>_____ Coordinate OA Plan with ITT to develop an integrated DT/OT approach.</p> <p>_____ Coordinate OA plan for AFOTEC/CC approval. (AFOTEC OT&E Guide, Atch A)</p> <p>_____ If program on oversight, ensure DOT&E approves adequacy.</p> <p>TD Notes:</p> <p>- Template "lock-down" for the OA plan, the point where the test team does not have to update the OA plan format to a new template version, is Technical Review (TR) 2 or six months prior to start test if TR 2 not accomplished.</p> <p>Outputs: Approved OA plan.</p> <p>Points of Contact: Test Team, ITT.</p>
<p>Execute OA OA Start OAs are conducted to provide insight into progress being made toward operational effectiveness, suitability, and mission capability. The OT&E construct will form the basis for an operational assessment. The construct used for the OA may not be the final construct, but it should give insight into the elements that make up effectiveness and suitability for the system under test. OAs also look into the program's future based on current information and observations to assess readiness for OT&E. OAs consist of two areas: progress toward operational capabilities, and progress towards readiness for OT&E. OA activities provide the information for assessing each area. These activities can include contractor or developer test events, program and documentation reviews, modeling and simulation, studies and analysis, testing by other agencies, etc.</p> <p>STATUS: _____</p>	<p>References: AFI 99-103, para, 2.6.9 and Chapter 8; AFOTEC OT&E Guide, paras 1.6 and 4.12.3 - 4.12.4; AFMAN 63-119.</p> <p>Inputs: OA Plan.</p> <p>Key Actions:</p> <p>_____ Conduct final preparation actions prior to OA start.</p> <p>_____ Execute deployment checklist. (AFOTEC OT&E Guide, para 5.7)</p> <p>_____ Execute OA procedures.</p> <p>_____ Conduct, as required, appropriate OA execution reporting.</p> <p>TD Notes:</p> <p>- Become familiar with all reporting requirements during OA execution.</p> <p>- Become familiar with information release restrictions.</p> <p>- Understand AFOTEC/CC's policy on communicating with SPO during test execution (see OT&E Guide paragraph 5.2).</p> <p>- An OA is a "snapshot in time" of the system; the system typically will not have completed development.</p> <p>Outputs: Data, appropriate OA execution reports.</p> <p>Points of Contact: Test Director, AFOTEC/SE.</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>AoA Update (if applicable) (<i>User</i>) MS C minus 6 mos</p> <p>Provide AFOTEC updates to the AoA as a result of activities from the system development and demonstration phase, if applicable.</p> <p>AFOTEC provides inputs to the updated AoA, including updated OT&E construct, which includes COIs, measures of operational effectiveness/ suitability and associated criteria, resulting from appropriate early influence and EOA/OA/OUE activities.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4, and para Encl 7.5; DAG, Chapter 9; AFI 10-601, para 4.4.1; AFI 63-101, paras 1.5.1.4 and 1.5.2.1; AFMAN 63-119, Atch 3; AFI 99-103; AF T&E Guidebook, para 4.3; AFOTEC OT&E Guide, para 1.14.1.1; AFOTEC/A3 AoA review checklist.</p> <p>Inputs: CDD (draft CPD), Previous AoA, ADM, test concept, TEMP.</p> <p>Key Actions:</p> <p>_____ Participate in the AoA Mission Effectiveness working group.</p> <p>_____ Provide potential OT&E information to AoA team.</p> <p>TD Notes:</p> <p>- Document review checklist located on the AFOTEC-Intranet Template page.</p> <p>Outputs: Approved AoA, AFOTEC input on operational construct.</p> <p>Points of Contact: Office of Aerospace Studies, MAJCOM.</p>
<p>TEMP Update (SPO/RTO/OTA) MS C minus 6 mos</p> <p>The SPO, using the ITT and starting with the MS B TEMP, updates the TEMP by recording: the critical technical parameters; integrated master test schedule (to include acquisition milestones, development schedule, integrated DT/OT and OT activities); T&E management responsibilities; detailed DT strategy and objectives; dedicated OT&E readiness entrance and exit criteria; and final T&E resources.</p> <p>AFOTEC provides input to Part III integrated DT/OT and OT test events. AFOTEC develops Part III OT&E details based on test concept/planning which include: 1) COIs; 2) Measures of Effectiveness (MOE)/Measures of Suitability (MOS) reflecting the CPD; 3) OT&E events with configuration description, objectives, scenarios, scope, methodology integrated test opportunities, and limitations; and 4) entrance criteria for starting dedicated IOT&E. AFOTEC provides input to Part IV OT&E resources include funding, manpower, and test articles/capabilities, including modeling and simulation. In order to ensure future testing adequacy, limitations to threat representation must be addressed, as this feeds into the Foreign Materiel Program. The TEMP is one of the formal methods to document threat limitations which are seen by external agencies.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4 and para Encl 6.2.b; DAG, paras 9.6.2 and 9.10 (format); AFI 99-103, paras 5.14 and 8.5.3; AF T&E Guidebook, para 5.8; AFOTEC OT&E Guide, para 1.14.4.</p> <p>Inputs: CDD (draft CPD*), test concept, TRP, Enabling CONOPs, Previous TEMP.</p> <p>Key Actions:</p> <p>_____ Use test concept (or draft test plan) to build OT section of TEMP.</p> <p>_____ Use TRP to build resource section of TEMP.</p> <p>_____ Maximize integrated DT/OT opportunities throughout TEMP.</p> <p>_____ Consider implications (inputs, resources) for MOT&Es. (MOA for MOT&Es, AFOTEC OT&E Guide, Atch A)</p> <p>_____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) modeling & simulation and test capability requirements are incorporated. (Defense Acquisition Guidebook (DAG), para 9.9; AFMAN 63-119; AFOTEC OT&E Guide, para 1.14.2; AFOTEC OT of IA Guide)</p> <p>_____ Ensure system readiness for OT&E certification requirements and RTT review process are addressed. (see TDT topic 2).</p> <p>_____ Ensure appropriate fidelity of OT activities (e.g., OAs, IOT&E, etc).</p> <p>_____ Ensure executable program schedule.</p> <p>_____ Follow-up on submitted comments.</p> <p>TD Notes:</p> <p>- If program on OSD oversight, be aware of additional interaction and coordination activities (AFOTEC OT&E guide, paragraph 1.14.6).</p> <p>- Document review checklist located on the AFOTEC-Intranet Template page.</p> <p>- *TEMP and CPD may be prepared in parallel; use draft CPD if necessary.</p> <p>Outputs: TEMP, with IDT/OT and dedicated OT&E construct, scope and methodology, and resources.</p> <p>Points of Contact: Program office, Test Team, ITT.</p>

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Programmatic Description	Test Director Actions
<p>ITT Charter Update (<i>ITT</i>)</p> <p>MS C minus 6 mos</p> <p>The SPO updates the ITT charter with applicable impacts resulting from the system development and demonstration phase activities.</p> <p>As co-chair of the ITT, AFOTEC provides charter updates on the OT strategy, OT roles and responsibilities and integrated T&E/OT products resulting from appropriate early influence and EOA/OA/OUE activities.</p> <p>STATUS: _____</p>	<p>References: AFI 63-101; AFI 99-103, paras 1.4, 3.14, 4.4, and 8.4.3; AFMAN 63-119; AF T&E Guidebook, paras 6.2.1, 7.1.3, 7.2 and Atch 5; AFOTEC OT&E Guide, paras 1.6.1, 1.8.1 and 4.10; AFOTEC-Intranet AFOTEC ITT Charter template.</p> <p>Inputs: Previous ITT Charter.</p> <p>Key Actions:</p> <p>_____ Determine any updates to AFOTEC role on ITT.</p> <p>_____ Prepare Charter updates. (AFI 99-103, para, 4.4, AFOTEC OT&E Guide, para 4.10)</p> <p>_____ Update ITT POC List.</p> <p>_____ Remind program office of AFMAN 63-119 requirements and expectations.</p> <p>_____ If not previously accomplished for ACAT I and II programs, coordinate with PM and readiness for OT&E certification official to establish readiness to test (RTT) review schedule and frequency (see TDT topic 2).</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - AFOTEC/CC signs charter. - Charter to be reviewed every 12 months and updated as required. <p>Outputs: Approved/Signed ITT Charter.</p> <p>Points of Contact: ITT members, AFOTEC/A3.</p>
<p>Environmental Safety and Occupational Health (ESOH) (<i>SPO</i>)</p> <p>MS C minus 6 mos</p> <p>This SPO-developed document provides AFOTEC updated PESHE, ESOH, and OSS&E support strategy with identified health and safety hazards. Documented determination human risk level if humans are used as subjects, and annotated/acted upon appropriately by Institutional Review Board (IRB) if necessary.</p> <p>AFOTEC performs an evaluation of updated safety aspects of T&E plans. Ensure all identified health and safety hazards have mitigation plans in place. If humans are used as test subjects, determine level of risk to the human and document accordingly.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, para Encl 12.6; DAG, Chapter 4, para 4.4.7 and Chapter 9, para 9.9.7; NSS Acq Policy Interim Guidance para Topic 1.1.8; AFI 63-101, paras 3.16.6, 3.49, and 3.77; AFI 63-1201, Atch 4; AFMAN 63-119, Atch 25; AF LCMP Guide; AFOTEC/PAM 99-104, Chapter 7; AFOTEC OT&E Guide, para 4.12.1.6.</p> <p>Inputs: CDD (draft CPD), TEMP.</p> <p>Key Actions:</p> <p>_____ Coordinate with Detachment/SE early.</p> <p>_____ Participate in ESOH process.</p> <p>_____ Ensure strategy is in place to identify/mitigate health and safety hazards.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - ESOH actions need to be complete prior to TRR. <p>Outputs: Environmentally sound, safe and healthy IDT/OT and OT plans.</p> <p>Points of Contact: AFOTEC/SE.</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>ISP Update (<i>RTO/OTA</i>)</p> <p>MS C minus 6 mos</p> <p>AFOTEC gains familiarity with the SPO's identification and documentation of information needs, infrastructure and intelligence support, information technology and National Security Systems interface requirements, and net-centric, interoperability, supportability and sufficiency concerns derived from the technology development phase results. Ensure the required NR-KPP and DOT&E special interest items (SII) centered on information assurance, interoperability and E³ are considered and implemented by the SPO.</p> <p>AFOTEC reviews and coordinates the ISP.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, Table 3; DAG, Chapter 7; AFI 63-101, para 3.67; AFMAN 63-119, Atch 10; AFI 99-103; AF T&E Guidebook, para 5.4; AFOTEC OT&E Guide, para 1.14.1.11; AFOTEC OT for IA Guide.</p> <p>Inputs: test concept, TEMP, TRP, CDD (draft CPD), previous ISP.</p> <p>Key Actions:</p> <p>_____ Maximize integrated DT/OT opportunities.</p> <p>_____ Ensure consistency with CPD information assurance concept.</p> <p>_____ Ensure the required NR-KPP and DOT&E special interest items (SII) centered on information assurance, interoperability and E³ are considered and implemented by the SPO.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - OT&E of IA Guide located on the AFOTEC-Intranet. - Consult with AFOTEC/A6 as needed. - Ensure SPO considers coordination with AFIOC or other approved IA test agency. <p>Outputs: ISP, validated IA and net-ready OT construct.</p> <p>Points of Contact: SPO, MAJCOM (<i>User</i>).</p>
<p>Operational Assessment Report (<i>OTA</i>)</p> <p>MS C minus 45 days</p> <p>AFOTEC expects access to the system and associated documentation in order to execute the OA.</p> <p>The results of the OA are documented in an AFOTEC OA report. This report will assess the progress toward operational effectiveness, suitability, and mission capability, assessing the COIs, and assessing the system's readiness for dedicated IOT&E. The report is provided in sufficient time to support the milestone decision.</p> <p>STATUS: _____</p>	<p>References: AFI 99-103, Chapter 8; AFOTEC OT&E Guide, paras 1.6, 6.3, and Atch A; AFMAN 63-119.</p> <p>Inputs: OA Plan, TEMP, OA data.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for OA Report.</p> <p>_____ Share OA observations with user/SPO to ensure understanding and facilitate deficiency corrective actions.</p> <p>_____ Ensure any observed deficiencies are entered into the deficiency reporting system.</p> <p>_____ Coordinate OA Report for AFOTEC/CC approval.</p> <p>_____ Capture lessons learned for future IOT&E planning.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Don't share final conclusions prior to AFOTEC/CC approval. - Refer to the current AFOTEC-Intranet OA final report template. Template "lock-down" for the OA final report, the point where the test team does not have to update the final report format to a new template version, is 30 days prior to OA start. <p>Outputs: Approved OA Report, lessons learned input, deficiency reports.</p> <p>Points of Contact: Test Team, A3</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Integrated Program Summary (IPS) (SPO)</p> <p>MS C minus 30 days</p> <p>Prior to each DSAB, the DoD Space MDA will convene an Independent Program Assessment Team (IPAT) to advise him on a program's readiness to advance into the next acquisition phase. The IPAT's findings and recommendations are presented to the DoD Space MDA at the DAB and the Build Approval. In preparation for the IPA, the SPD/PM produces a consolidated set of program documentation, known as an Integrated Program Summary (IPS), to facilitate the IPAT review.</p> <p>STATUS: _____</p>	<p>References: NSS Acquisition Policy Interim Guidance</p> <p>Inputs: OA Report</p> <p>Key Actions:</p> <p>_____ Facilitate report and findings with SPO and MAJCOM</p> <p>_____ Monitor SPO and MAJCOM reply and concerns</p> <p>_____ Elevate actions to leadership</p> <p>TD Notes:</p> <p>- Be sure to coordinate any concerns IAW procedures in OT&E Guide.</p> <p>Outputs: IPS inputs</p> <p>Points of Contact: AFSPC/SMC (SPO)</p>
<p>Acquisition Decision Memorandum (ADM) (SPO)</p> <p>MS C plus 6 mos</p> <p>AFOTEC needs to be cognizant of the decisions documented in the ADM in support of the Milestone B. Support and implement the OT activities (such as involvement decision, early influence, initial test planning, co-developing the ITT) required by the ADM.</p> <p>STATUS: _____</p>	<p>References: AFI 63-101, para 3.40.</p> <p>Inputs: CDD, MS C.</p> <p>Key Actions:</p> <p>_____ Verify accuracy of previous information (AFOTEC tasking order, CDD).</p> <p>_____ Coordinate ITT standup with SPO.</p> <p>_____ Determine need for T&E Strategy.</p> <p>TD Notes:</p> <p>- AFOTEC/CC coordinates on the ADM.</p> <p>Outputs: MDA decisions for entering the Engineering and Manufacturing Development Phase, AFOTEC "Quad Chart" information.</p> <p>Points of Contact: PEM.</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Capabilities Document High Performance Teams (HPT) (User)</p> <p>Build Approval minus 18 mos</p> <p>AFOTEC is invited to participate in the CPD HPT as a core team member to assist in developing capability requirements for a known mission capability gap.</p> <p>AFOTEC assists in the JCIDS process to develop capabilities requirements documented in the CPD by contributing considerations such as completeness, relevance, soundness of operational capability requirements, and the testability of those requirements.</p> <p>STATUS: _____</p>	<p>References: CJCSI 3170.01; JCIDS Manual; DoD 5000.02; AFI 10-601, para 2.3.3; AFI 99-103; AF T&E Guidebook, Atch 3; AFOTEC OT&E Guide, para 2.4.</p> <p>Inputs: draft CPD (if available), HPT Schedule, test concept, TEMP.</p> <p>Key Actions:</p> <p>_____ Review available documentation (draft CPD, test concept, TEMP, etc). (AFOTEC/A3 CPD Review Checklist)</p> <p>_____ Ensure mandatory KPP/KSA are considered. (CJCSI 3170.01, para Encl B.3.)</p> <p>_____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) are considered. (Defense Acquisition Guidebook (DAG), para 9.9; AFMAN 63-119; AFOTEC OT&E Guide, para 1.14.2; AFOTEC OT of IA Guide)</p> <p>TD Notes:</p> <p>- Looking for complete, operationally relevant, and testable requirements. (AFOTEC OT&E Guide, para 1.14.1.4)</p> <p>Outputs: Draft CPD to be staffed in IRSS, test adequate AFOTEC IDT/OT and OT&E plan.</p> <p>Points of Contact: AF/A5RD, AFSPC (<i>User</i>).</p>

HPT

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Capabilities Production Document (CPD) (User)</p> <p>Build Approval minus 12 mos</p> <p>AFOTEC is provided the opportunity to review the CPD (JROC approval) and provide “operational tester” feedback. Gain understanding of the finalized required KPPs and KSA in relation to operational capability critical operational issues, performance operational measures and associated criteria expressed by thresholds and objectives.</p> <p>AFOTEC provides feedback to ensure the capability requirements reflect the needed operational capabilities. These capability requirements must be complete, operationally relevant, and testable. Feedback discovered during test planning activities including any conducted OA to determine progress towards capability performance is provided. Initial test design and plans, to include TEMP Part III inputs, are developed using the CPD.</p> <p>STATUS: _____</p>	<p>References: JCIDS Manual, Encl H; DoD 5000.02; NSS Acq Policy Interim Guidance; DAG, para 9.1.2.3; AFI 10-601, Chapter 6; AFI 99-103, para 6.3.2; AFMAN 63-119, Atch 4; AFOTEC/A3 CDD Review Checklist; AFOTEC OT&E Guide, para 1.14.1.4.</p> <p>Inputs: draft CPD (via IRSS), previous review checklist and ESC, test concept, TEMP, TRP.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Coordinate access to document on IRSS and staffing with A3 _____ Confirm HPT inputs incorporated in CPD. _____ Ensure complete, operationally relevant, and testable requirements via document review checklist. _____ Ensure mandatory KPP/KSA are considered. (CJCSI 3170.01, para Encl B.3.) _____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) are considered. (Defense Acquisition Guidebook (DAG), para 9.9; AFMAN 63-119; AFOTEC OT&E Guide, para 1.14.2; AFOTEC OT of IA Guide) _____ Review comments submitted to CDD for incorporation. _____ Follow-up on submitted comments. _____ Cross-check capability requirements with intended enabling concept of operations . <p>TD Notes:</p> <ul style="list-style-type: none"> - Document review checklist located on the AFOTEC-Intranet Template page. - AFOTEC/CC approves all comments prior to submission via IRSS. - CPD may require updating previous test design, initial test plan, and TRP. Test design validation activities are described in OT&E Guide. - Test plans, to include TEMP parts III and IV inputs, are developed using the CPD. <p>Outputs: CPD, AFOTEC testability input on KPP, KSA and other system requirements.</p> <p>Points of Contact: AFSPC (<i>User</i>).</p>

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Table 3. Space OT&E Model Activities

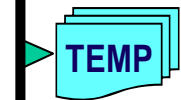
Programmatic Description	Test Director Actions
<p>OA Plan (OTA)</p> <p>Build Approval minus 6 mos</p> <p>AFOTEC requires sufficient programmatic information to develop the OT&E OA Plan in support of the Build Approval decision. This information will include: operational capability requirements, acquisition strategy, developmental test activities, and concept of operations.</p> <p>This is an AFOTEC-produced document outlining the OTA's plan for assessing the progress toward operational effectiveness, suitability, and mission capability of the system being acquired as well as assessing the readiness of the system for the planned IOT&E.</p> <p>STATUS: _____</p>	<p>References: DoDI, 5000.02, para Encl 2 6.d.14; AFI 99-103, para 2.6.9 and Chapter 8; AFOTEC OT&E Guide, paras 1.6 and 4.12.3 - 4.12.4; AFMAN 63-119.</p> <p>Inputs: CDD (draft CPD), TEMP, test concept, OA Plan Template, TRP.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for OA plan.</p> <p>_____ Review lessons learned</p> <p>_____ Ensure latest plan template is used.</p> <p>_____ See latest signed OA plan for reference.</p> <p>_____ Conduct technical review #2. (AFOTEC OT&E Guide, para 4.4)</p> <p>_____ Coordinate OA Plan with ITT to develop an integrated DT/OT approach.</p> <p>_____ Coordinate OA plan for AFOTEC/CC approval. (AFOTEC OT&E Guide, Atch A)</p> <p>_____ If program on oversight, ensure DOT&E approves adequacy.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Template "lock-down" for the OA plan, the point where the test team does not have to update the OA plan format to a new template version, is Technical Review (TR) 2 or six months prior to start test if TR 2 not accomplished. <p>Outputs: Approved OA plan.</p> <p>Points of Contact: Test Team, ITT.</p>
<p>Execute OA</p> <p>OA Start</p> <p>OAs are conducted to provide insight into progress being made toward operational effectiveness, suitability, and mission capability. The OT&E construct will form the basis for an operational assessment. The construct used for the OA may not be the final construct, but it should give insight into the elements that make up effectiveness and suitability for the system under test. OAs also look into the program's future based on current information and observations to assess readiness for OT&E. OAs consist of two areas: progress toward operational capabilities, and progress towards readiness for OT&E. OA activities provide the information for assessing each area. These activities can include contractor or developer test events, program and documentation reviews, modeling and simulation, studies and analysis, testing by other agencies, etc.</p> <p>STATUS: _____</p>	<p>References: AFI 99-103, para, 2.6.9 and Chapter 8; AFOTEC OT&E Guide, paras 1.6 and 4.12.3 - 4.12.4; AFMAN 63-119.</p> <p>Inputs: OA Plan.</p> <p>Key Actions:</p> <p>_____ Conduct final preparation actions prior to OA start.</p> <p>_____ Execute deployment checklist. (AFOTEC OT&E Guide, para 5.3)</p> <p>_____ Execute OA procedures.</p> <p>_____ Conduct, as required, appropriate OA execution reporting.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Become familiar with all reporting requirements during OA execution. - Become familiar with information release restrictions. - Understand AFOTEC/CC's policy on communicating with SPO during test execution (see OT&E Guide paragraph 5.2). - An OA is a "snapshot in time" of the system; the system typically will not have completed development. <p>Outputs: Data, appropriate OA execution reports.</p> <p>Points of Contact: Test Director, AFOTEC/SE.</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>TEMP Update (SPO/RTO/OTA)</p> <p>Build Approval minus 6 mos</p> <p>The SPO, using the ITT and starting with the MS C TEMP, updates the TEMP by recording: the critical technical parameters; integrated master test schedule (to include but not limited to acquisition milestones, development schedule, integrated DT/OT and OT activities); T&E management responsibilities; detailed DT strategy and objectives; dedicated OT&E readiness entrance and exit criteria; and final T&E resources.</p> <p>AFOTEC provides input to Part III integrated DT/OT and OT test events. AFOTEC develops Part III OT&E details based on test concept/planning which include: 1) COIs; 2) MOEs/MOSs reflecting the CPD; 3) OT&E events with configuration description, objectives, scenarios, scope, methodology integrated test opportunities, and limitations; and 4) entrance criteria for starting dedicated IOT&E. AFOTEC provides input to Part V OT&E resources include funding, manpower, and test articles/capabilities, including modeling and simulation. In order to ensure future testing adequacy, limitations to threat representation must be addressed, as this feeds into the Foreign Materiel Program. The TEMP is one of the formal methods to document threat limitations which are seen by external agencies.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4, and para Encl 6.2.b; NSS Acq Policy Interim Guidance; DAG, paras 9.6.2 and 9.10 (format); AFI 99-103, paras 5.14 and 8.5.3; AF T&E Guidebook, para 5.8; AFOTEC OT&E Guide, para 1.14.4.</p> <p>Inputs: CPD (draft*), test concept, TRP, Enabling CONOPs, Previous TEMP.</p> <p>Key Actions:</p> <p>_____ Use test concept to build OT section of TEMP.</p> <p>_____ Use TRP to build resource section of TEMP.</p> <p>_____ Maximize integrated DT/OT opportunities throughout TEMP.</p> <p>_____ Consider multiservice implications (inputs, resources) for MOT&Es. (MOA for MOT&Es, AFOTEC OT&E Guide, Atch A)</p> <p>_____ Ensure special interest items (IA, Interoperability, E3, GPS Signal Loss) modeling & simulation and test capability requirements are incorporated. (Defense Acquisition Guidebook (DAG), para 9.9; AFMAN 63-119; AFOTEC OT&E Guide, para 1.14.2; AFOTEC OT of IA Guide)</p> <p>_____ Ensure system readiness for OT&E certification requirements and RTT review process are addressed. (see TDT topic 2).</p> <p>_____ Ensure appropriate fidelity of OT activities (e.g., OAs, IOT&E, etc).</p> <p>_____ Ensure executable program schedule.</p> <p>_____ Follow-up on submitted comments.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - If program on OSD oversight, be aware of additional interaction and coordination activities. (AFOTEC OT&E guide, paragraph 1.14.6) - Document review checklist located on the AFOTEC-Intranet Template page. - *TEMP and CPD may be prepared in parallel; use draft CDD if necessary. <p>Outputs: TEMP, with IDT/OT and dedicated OT&E construct, scope and methodology, and resources.</p> <p>Points of Contact: Program office, ITT, Test Team.</p>



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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<div data-bbox="51 205 267 1495" data-label="Diagram"> </div> <p>Operational Assessment Report (OTA) Build Approval minus 45 days (or as negotiated)</p> <p>AFOTEC expects access to the system and associated documentation in order to execute the OA.</p> <p>The results of the OA are documented in an AFOTEC OA report. This report will assess the progress toward operational effectiveness, suitability, and mission capability, assessing the COIs, and assessing the system's readiness for dedicated IOT&E. The report is provided in sufficient time to support the milestone decision.</p> <p>STATUS: _____</p>	<p>References: AFI 99-103, Chapter 8; AFOTEC OT&E Guide, paras 1.6, 6.3, and Atch A; AFMAN 63-119.</p> <p>Inputs: OA Plan, TEMP, OA data.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for OA Report.</p> <p>_____ Share OA observations with user/SPO to ensure understanding and facilitate deficiency corrective actions.</p> <p>_____ Ensure any observed deficiencies are entered into the deficiency reporting system.</p> <p>_____ Coordinate OA Report for AFOTEC/CC approval.</p> <p>_____ Capture lessons learned for future IOT&E planning.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Don't share final conclusions prior to AFOTEC/CC approval. - Refer to the current AFOTEC-Intranet OA final report template. Template "lock-down" for the OA final report, the point where the test team does not have to update the final report format to a new template version, is 30 days prior to OA start. <p>Outputs: Approved OA Report, lessons learned input, deficiency reports.</p> <p>Points of Contact: Test Team, A3</p>
<p>Integrated Program Summary (IPS) (SPO) Build Approval minus 30 days</p> <p>Prior to each DAB, the DoD Space MDA will convene an Independent Program Assessment Team (IPAT) to advise him on a program's readiness to advance into the next acquisition phase. The IPAT's findings and recommendations are presented to the DoD Space MDA at the DAB and the Build Approval. In preparation for the IPA, the SPD/PM produces a consolidated set of program documentation, known as an Integrated Program Summary (IPS), to facilitate the IPAT review.</p> <p>STATUS: _____</p>	<p>References: NSS Acquisition Policy Interim Guidance.</p> <p>Inputs: OA Report</p> <p>Key Actions:</p> <p>_____ Facilitate report and findings with SPO and MAJCOM</p> <p>_____ Monitor SPO and MAJCOM reply and concerns</p> <p>_____ Elevate actions to leadership</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Be sure to coordinate any concerns IAW procedures in OT&E Guide. <p>Outputs: IPS inputs</p> <p>Points of Contact: PM</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Operational Utility Evaluation Plan (OTA)</p> <p>OUE Start minus 6 mos</p> <p>An OUE is the evaluation of military capability conducted to demonstrate or validate new operational concepts or capabilities, upgrade components, or expand the mission or capabilities of existing or modified systems. Partial capability deliveries within an increment are not intended to be fielded; however, there are times when the decision maker may accept the risk associated with fielding these partial capabilities. The OUE was designed to allow AFOTEC a convenient and proper tool to assist both users and decision makers in determining the utility and value of a system or partial capability. Multiple OUEs can be conducted prior to the IOT&E; however, the OUE cannot be used to take the place of IOT&E for ACAT I, II, or OSD Oversight programs.</p> <p>STATUS: _____</p>	<p>References: DAG, para 9.4; AFI 99-103, para 2.6.8 and Chapter 8; AFOTEC OT&E Guide, paras 1.6, 4.12.5 and 4.12.6; TDT Topic 1, Design of Experiments; TDT Topic 3, Implementing the Dec 2007 Section 231 Report.</p> <p>Inputs: CPD, TEMP, test concept.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for OUE plan.</p> <p>_____ Review lessons learned</p> <p>_____ Ensure latest plan template is used.</p> <p>_____ Refer to the current AFOTEC-Intranet OUE Test Plan template.</p> <p>_____ See latest signed OUE plan for reference.</p> <p>_____ Conduct technical review #2. (AFOTEC OT&E Guide, para 4.4)</p> <p>_____ Coordinate OUE Plan with ITT to develop an integrated DT/OT approach.</p> <p>_____ Coordinate OUE plan for AFOTEC/CC approval. (AFOTEC OT&E Guide, Atch A)</p> <p>_____ Send OUE Plan to program Executive Officer (PEO) for acknowledgement.</p> <p>_____ Develop data management and analysis plan (DMAP) in parallel. (AFOTEC OT&E Guide, para 4.14.1)</p> <p>_____ Develop detailed test plan (DTP) in parallel. (AFOTEC OT&E Guide, para 4.14.3)</p> <p>_____ If program on oversight, ensure DOT&E approves adequacy.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - A test plan briefing may be requested by DOT&E. - Template “lock-down” for the test plan, the point where the test team does not have to update the test plan format to a new template version, is after completion of technical review # 2. <p>Outputs: Approved OUE plan.</p> <p>Points of Contact: Test Team, ITT</p>
<p>Test Readiness Review (TRR) Briefing (OTA)</p> <p>OUE Start minus 60 days</p> <p>The TRR briefing is a presentation to the AFOTEC/CC of the system and test team readiness to start the OUE. The TRR briefing is conducted prior to the system certification briefing to the PEO.</p> <p>STATUS: _____</p>	<p>References: AFOTEC OT&E Guide, para 4.16; TDT Topic 2, Pre-Certification Review Cycle</p> <p>Inputs: AFMAN 63-119 Template Status, OT Plan.</p> <p>Key Actions:</p> <p>_____ Prepare AFOTEC/CC TRR briefing. (AFOTEC OT&E Guide, para 4.16)</p> <p>_____ Prepare AFOTEC/CC Certification Acknowledgement Memo. (AFOTEC OT&E Guide, para 4.16.2 and 4.16.3)</p> <p>_____ Remain in contact with the SPO regarding status of certification letter.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - TRR is conducted without PEO certification letter, but status of system certification must be known. <p>Outputs: TRR Briefing, Certification Acknowledgement Memo.</p> <p>Points of Contact: PM, PEO or designated Certification Official, ITT</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Operational Test Readiness Certification Letter (following AFMAN 63-119 templates) (PEO)</p> <p>OUE start minus 15 days</p> <p>The SPO provides a certification readiness memo from the system program's PEO (or designated Certification Official), sent to the AFOTEC commander approximately 15 days prior to start of dedicated OUE, or as agreed.</p> <p>The AFOTEC commander will acknowledge the certification before starting dedicated OUE and either concur or non-concur with the Certification Official's assessment, restating any reservations or positions on unresolved issues.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.05, para Encl 6.4; DAG, para 9.3.6; AFMAN 63-119, Chapters 1 & 2; AFI 99-103, para 6.6; AFOTEC OT&E Guide, para 4.16; TDT Topic 2, Pre-Certification Review Cycle</p> <p>Inputs: AFMAN 63-119 Template Status, PEO AOTR Briefing, OT Plan.</p> <p>Key Actions:</p> <p>_____ Finalize AFOTEC/CC Certification Acknowledgement Memo (if required). (AFOTEC OT&E Guide, para 4.16.2 and 4.16.3)</p> <p>_____ Remain in contact with the SPO regarding status of certification letter.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Certification memo may contain system limitations. <p>Outputs: Certification Acknowledgement Memo (if not previously accomplished).</p> <p>Points of Contact: PM, PEO or designated Certification Official, ITT</p>
<p>OUE Execution (OTA)</p> <p>OUE Start</p> <p>Typically, OUE execution begins with the AFOTEC/CC go-ahead received at the TRR. Activities expected to be accomplished during test execution are: resource management, deployment checklist, dry running the test procedures, final preparation before starting test, actual test execution, data management during execution, Secure Internet Protocol Routing Network (SIPRNet) operations reporting requirements, formal OT&E reports during execution, and other considerations during test execution.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, para Encl 6. 5.b. & c; AFI 99-103, para 2.6.8 and Chapter 8; AFOTEC OT&E Guide, paras 1.6, 4.12.5 and 4.12.6; Chapter 5.</p> <p>Inputs: OUE Plan, DMAP, DTP, Approved TRR.</p> <p>Key Actions:</p> <p>_____ Conduct final preparation actions prior to dedicated OUE start.</p> <p>_____ Conduct dry runs. (AFOTEC OT&E Guide, para 5.7)</p> <p>_____ Execute deployment checklist. (AFOTEC OT&E Guide, para 5.3)</p> <p>_____ Execute test procedures.</p> <p>_____ Conduct, as required, appropriate test execution reporting.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Become familiar with all reporting requirements during test execution. - Become familiar with information release restrictions. - Be aware of Pause and Stop test procedures; discuss prior to test start what would necessitate a pause or a stop. - Understand procedures for access to test execution (SPO, contractor, DOT&E). - Understand AFOTEC/CC's policy on communicating with SPO during test execution (see OT&E Guide paragraph 5.2). <p>Outputs: Data, appropriate execution reports.</p> <p>Points of Contact: A3, AFOTEC/SE.</p>

Cert Letter

Execute OUE

Timeline Legend: ● = User Product ● = SPO Product ● = ITT Product ● = AFOTEC Product

Inputs = key documents or predecessors to the item; Key Actions = steps or things to be done; Outputs = products or activities resulting from the item; references = pointer to specific reference document; TD Notes = reminder items, best practices, or helpful hints.

Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>OUE Final Report (OTA) Fielding Decision minus 45 days The results of the OUE are documented in an AFOTEC final report. This report will make a determination of effectiveness and suitability, rate the COIs, and determine the overall mission capability of the system or partial system capability being fielded. Any limitations/shortfalls encountered during test are documented, along with any impacts observed/expected in the operational environment.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, Encl 4; AFI 99-103, Chapter 7; AF T&E Guidebook, Chapter 10; AFOTEC OT&E Guide, Chapter 6.</p> <p>Inputs: OUE Plan, TEMP, OUE data, Last Test Event.</p> <p>Key Actions:</p> <p>_____ Tailor and execute program management network for OUE Report.</p> <p>_____ Refer to the current AFOTEC-Intranet OUE final report template.</p> <p>_____ Share OUE observations with user/SPO to ensure understanding and facilitate deficiency corrective actions.</p> <p>_____ Ensure any observed deficiencies are entered into the deficiency reporting system.</p> <p>_____ Coordinate OUE Report for AFOTEC/CC approval. (AFOTEC OT&E Guide, Atch A)</p> <p>_____ If full report cannot be produced in time for the decision, obtain permission to produce an Interim Summary Report (ISR). (AFOTEC OT&E Guide, para 6.6)</p> <p>_____ Capture lessons learned. (AFOTEC OT&E Guide, para 1.14.10)</p> <p>_____ Following submission of final report, begin closeout activities as appropriate.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Don't share final conclusions prior to AFOTEC/CC approval. - Report must be released 45 days prior to decision review. - Template "lock-down" for the final report, the point where the test team does not have to update the final report format to a new template version, is after approval of the test readiness review. <p>Outputs: Approved OUE Report, lessons learned input, deficiency reports.</p> <p>Points of Contact: A3, Test Team.</p>



Timeline Legend: = User Product = SPO Product = ITT Product = AFOTEC Product

Inputs = key documents or predecessors to the item; Key Actions = steps or things to be done; Outputs = products or activities resulting from the item; references = pointer to specific reference document; TD Notes = reminder items, best practices, or helpful hints.

Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<div data-bbox="129 693 259 808" data-label="Image"> </div> <p>OT&E Test Plan (OTA) IOT&E minus 6 mos AFOTEC requires sufficient programmatic information to develop the OT&E Test Plan. This information will include: operational capability requirements, acquisition strategy, developmental test activities, and concept of operations.</p> <p>This is an AFOTEC-produced document outlining the OTA's plan for determining the effectiveness and suitability of the system being acquired.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, para Encl 2.6.d.(14) and para Encl 6.5; DAG, para 9.4; AFMAN 63-119, Atch 23; AFI 99-103, para 2.6.1 and Chapters 5, 6 and 8; AF T&E Guidebook, Chapter 10; AFOTEC OT&E Guide, paras 1.6, 4, 4.12.5 and 4.12.6 and Chapter 5; TDT Topic 1, Design of Experiments, TDT Topic 3, Implementing the Dec 2007 Section 231 Report.</p> <p>Inputs: CPD, TEMP, test concept, OA Report, TRP, OA lessons learned.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Tailor and execute program management network for IOT&E plan. _____ Review lessons learned _____ Ensure latest plan template is used. _____ Refer to the current AFOTEC-Intranet IOT&E Test Plan template. _____ See latest signed IOT&E plan for reference. _____ Conduct technical review #2. (AFOTEC OT&E Guide, para 4.4) _____ Coordinate IOT&E Plan with ITT to develop an integrated DT/OT approach. _____ Coordinate IOT&E plan for AFOTEC/CC approval. (AFOTEC OT&E Guide, Atch A) _____ Send IOT&E Plan to PEO for acknowledgement. (AFOTEC OT&E Guide, para 4.14.1) _____ Develop data management and analysis plan (DMAP) in parallel. _____ Develop detailed test plan (DTP) in parallel. (AFOTEC OT&E Guide, para 4.14.3) _____ If program on oversight, ensure DOT&E approves adequacy. <p>TD Notes:</p> <ul style="list-style-type: none"> - If conducting an OUE prior to the IOT&E, the procedures are the same. - A test plan briefing may be requested by DOT&E. - Template "lock-down" for the test plan, the point where the test team does not have to update the test plan format to a new template version, is after completion of technical review # 2. <p>Outputs: Approved IOT&E plan.</p> <p>Points of Contact: Test Team, ITT</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Environmental Safety and Occupational Health (ESOH) (SPO)</p> <p>IOT&E minus 60 days</p> <p>The SPO provides AFOTEC: 1) Safety Release to testers prior to any test using personnel. 2) Final ESOH evaluations of the system. 3) Human Use Protocol and final human risk level annotated/acted upon appropriately by Institutional Review Board (IRB) if humans are used as subjects.</p> <p>AFOTEC performs a final evaluation of the safety aspects of T&E plans prior to IOT&E. Ensure all identified health and safety hazards have been mitigated and accepted at the appropriate Risk Authority level. If humans are used as test subjects, evaluate validity of IRB protocols for IOT&E.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, para Encl 12.6; DAG, Chapter 4, para 4.4.7 and Chapter 9, para 9.9.7; NSS Acquisition Policy Interim Guidance; para Topic 1.1.8, AFI 63-101, para 3.16.6, para 3.49, para 3.77, AFI 63-1201, Atch 4; AFMAN 63-119, Atch 25; AF LCMP Guide; AFOTEC PAM 99-104, Chapter 7; AFOTEC OT&E Guide, para 4.12.1.6.</p> <p>Inputs: CPD, TEMP.</p> <p>Key Actions:</p> <p>_____ Coordinate with Detachment/SE early.</p> <p>_____ Participate in ESOH process.</p> <p>_____ Complete ESOH Certification Board.</p> <p>_____ Ensure strategy is in place to identify/mitigate health and safety hazards.</p> <p>TD Notes:</p> <p>- ESOH actions need to be complete prior to TRR.</p> <p>Outputs: Environmentally sound, safe and healthy IDT/OT and OT execution.</p> <p>Points of Contact: AFOTEC/SE.</p>
<p>Test Readiness Review (TRR) Briefing (OTA)</p> <p>IOT&E minus 60 days</p> <p>The TRR briefing is a presentation to the AFOTEC/CC of the system and test team readiness to start the IOT&E. The TRR briefing is conducted prior to the system certification briefing to the PEO.</p> <p>STATUS: _____</p>	<p>References: AFOTEC OT&E Guide, para 4.16; TDT Topic 2, Pre-Certification Review Cycle</p> <p>Inputs: AFMAN 63-119 Template Status, OT Plan.</p> <p>Key Actions:</p> <p>_____ Prepare AFOTEC/CC TRR briefing. (AFOTEC OT&E Guide, para 4.16)</p> <p>_____ Prepare AFOTEC/CC Certification Acknowledgement Memo. (AFOTEC OT&E Guide, para 4.16.2 and 4.16.3)</p> <p>_____ Remain in contact with the SPO regarding status of certification letter.</p> <p>TD Notes:</p> <p>- TRR is conducted without PEO certification letter, but status of system certification must be known.</p> <p>Outputs: TRR Briefing, Certification Acknowledgement Memo.</p> <p>Points of Contact: PM, PEO or designated Certification Official, ITT</p>

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Operational Test Readiness Certification Letter (following AFMAN 63-119 templates) (<i>PEO</i>)</p> <p>IOT&E start minus 30 days</p> <p>The SPO provides a certification readiness memo from the system program's PEO (or designated OT&E Certification Official), sent to the AFOTEC commander approximately 15 days prior to start of dedicated IOT&E, or as agreed.</p> <p>The AFOTEC commander will acknowledge the certification before starting dedicated IOT&E and either concur or non-concur with the OT&E Certification Official's assessment, restating any reservations or positions on unresolved issues.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.05, para Encl 6.4; DAG, para 9.3.6; AFMAN 63-119, Chapters 1 & 2; AFI 99-103, para 6.6; AFOTEC OT&E Guide, para 4.16; TDT Topic 2, Pre-Certification Review Cycle</p> <p>Inputs: AFMAN 63-119 Template Status, PEO AOTR Briefing, OT Plan.</p> <p>Key Actions:</p> <p>_____ Finalize AFOTEC/CC Certification Acknowledgement Memo (if required). (AFOTEC OT&E Guide, para 4.16.2 and 4.16.3)</p> <p>_____ Remain in contact with the SPO regarding status of certification letter.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Certification memo may contain system limitations. <p>Outputs: Certification Acknowledgement Memo (if not previously accomplished).</p> <p>Points of Contact: PM, PEO or designated Certification Official, ITT</p>
<p>IOT&E (Phase 1) Execution (<i>OTA</i>)</p> <p>IOT&E Start</p> <p>Typically, OT Execution begins with the AFOTEC/CC go-ahead received at the TRR. Activities expected to be accomplished during test execution are: resource management, deployment checklist, dry running the test procedures, final preparation before starting test, actual test execution, data management during execution, SIPRNet operations reporting requirements, formal OT&E reports during execution, and other considerations during test execution.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, para Encl 6. 5.b. & c; AFI 99-103, para 2.6.8 and Chapter 8; AFOTEC OT&E Guide, paras 1.6, 4.12.5, 4.12.6, and Chapter 5.</p> <p>Inputs: Test Plan, DMAP, DTP, Approved TRR.</p> <p>Key Actions:</p> <p>_____ Conduct final preparation actions prior to dedicated OT&E start.</p> <p>_____ Conduct dry runs. (AFOTEC OT&E Guide, para 5.7)</p> <p>_____ Execute deployment checklist. (AFOTEC OT&E Guide, para 5.3)</p> <p>_____ Execute test procedures.</p> <p>_____ Conduct, as required, appropriate test execution reporting.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Become familiar with all reporting requirements during test execution. - Become familiar with information release restrictions. - Be aware of Pause and Stop test procedures; discuss prior to test start what would necessitate a pause or a stop. - Understand procedures for access to test execution (SPO, contractor, DOT&E). - Understand AFOTEC/CC's policy on communicating with SPO during test execution (see OT&E Guide paragraph 5.2). <p>Outputs: Data, appropriate execution reports.</p> <p>Points of Contact: A3, AFOTEC/SE.</p>

Cert Letter

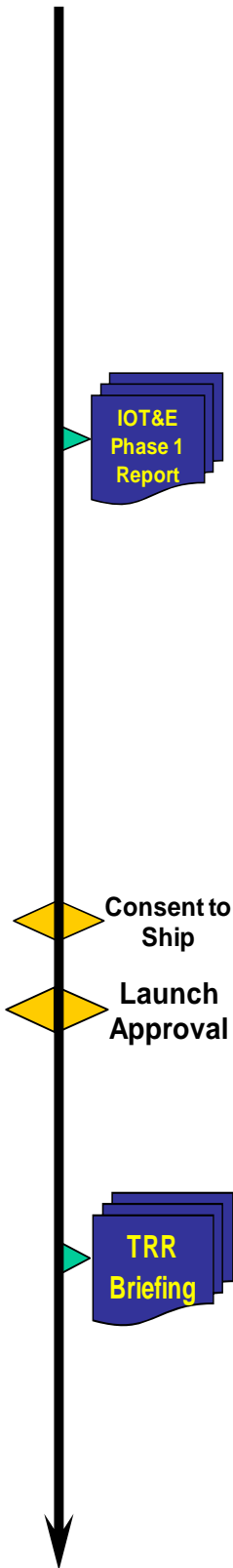
Execute IOT&E

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>OT&E Phase 1 Final Report (OTA) Consent to Ship minus 45 days</p> <p>AFOTEC expects a fully production representative system (for the part of the system being tested) to be delivered to execute the dedicated OT&E. Representative system users and maintainers are also required to execute the OT&E.</p> <p>The results of the OT&E are documented in an AFOTEC final report. This report will make a determination of effectiveness and suitability, rate the COIs, and determine the overall mission capability of the system. Any limitations/shortfalls encountered during test are documented, along with any impacts observed/expected in the operational environment.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, Encl 4; AFI 99-103, Chapter 7; AF T&E Guidebook, Chapter 10; AFOTEC OT&E Guide, Chapter 6.</p> <p>Inputs: IOT&E Plan, TEMP, IOT&E data, Last Test Event.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Tailor and execute program management network for IOT&E Report. _____ Refer to the current AFOTEC-Intranet IOT&E final report template. _____ Share IOT&E observations with user/SPO to ensure understanding and facilitate deficiency corrective actions. _____ Ensure any observed deficiencies are entered into the deficiency reporting system. _____ Coordinate IOT&E Report for AFOTEC/CC approval. (AFOTEC OT&E Guide, Atch A) _____ If full report cannot be produced in time for the decision, obtain permission to produce an Interim Summary Report (ISR). (AFOTEC OT&E Guide, para 6.6) _____ Execute hotwash and capture lessons learned. (AFOTEC OT&E Guide, Atch A) _____ Document actual savings from IDT/OT (\$, time, test assets) in the report <p>TD Notes:</p> <ul style="list-style-type: none"> - Don't share final conclusions prior to AFOTEC/CC approval. - Report must be released 45 days prior to decision review. - Template "lock-down" for the final report, the point where the test team does not have to update the final report format to a new template version, is after approval of the test readiness review. <p>Outputs: Approved IOT&E Report, lessons learned input, deficiency reports.</p> <p>Points of Contact: A3, test team.</p>
<p>Test Readiness Review (TRR) Briefing (OTA) IOT&E Phase 2 start minus 60 days</p> <p>The TRR briefing is a presentation to the AFOTEC/CC of the system and test team readiness to start the IOT&E. The TRR briefing is conducted prior to the system certification briefing to the PEO.</p> <p>STATUS: _____</p>	<p>References: AFOTEC OT&E Guide, para 4.16; TDT Topic 2, Pre-Certification Review Cycle</p> <p>Inputs: AFMAN 63-119 Template Status, OT Plan.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Prepare AFOTEC/CC TRR briefing. (AFOTEC OT&E Guide, para 4.16) _____ Prepare AFOTEC/CC Certification Acknowledgement Memo. (AFOTEC OT&E Guide, para 4.16.2 and 4.16.3) _____ Remain in contact with the SPO regarding status of certification letter. <p>TD Notes:</p> <ul style="list-style-type: none"> - TRR is conducted without PEO certification letter, but status of system certification must be known. <p>Outputs: TRR Briefing, Certification Acknowledgement Memo.</p> <p>Points of Contact: PM, PEO or designated Certification Official, ITT</p>



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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<p>Operational Test Readiness Certification Letter (<i>following AFMAN 63-119 templates</i>) (PEO)</p> <p>IOT&E Phase 2 start minus 15 days</p> <p>The SPO provides a certification readiness memo from the system program's PEO (or designated OT&E Certification Official) for the full system configuration, sent to the AFOTEC commander approximately 15 days prior to start of dedicated IOT&E, or as agreed.</p> <p>The AFOTEC commander will acknowledge the certification before starting dedicated IOT&E and either concur or non-concur with the OT&E Certification Official's assessment, restating any reservations or positions on unresolved issues.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.05, para Encl 6.4; DAG, para 9.3.6; AFMAN 63-119, Chapters 1 & 2; AFI 99-103, para 6.6; AFOTEC OT&E Guide, para 4.16; TDT Topic 2, Pre-Certification Review Cycle</p> <p>Inputs: AFMAN 63-119 Template Status, PEO AOTR Briefing, OT Plan.</p> <p>Key Actions:</p> <p>_____ Finalize AFOTEC/CC Certification Acknowledgement Memo (if required). (AFOTEC OT&E Guide, para 4.16.2 and 4.16.3)</p> <p>_____ Remain in contact with the SPO regarding status of certification letter.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Certification memo may contain system limitations. <p>Outputs: Certification Acknowledgement Memo (if not previously accomplished).</p> <p>Points of Contact: PM, PEO or designated Certification Official, ITT</p>
<p>IOT&E Phase 2 Execution (OTA)</p> <p>IOT&E Phase 2 Start</p> <p>Typically, OT Execution begins with the AFOTEC/CC go-ahead received at the TRR. Activities expected to be accomplished during test execution: resource management, deployment checklist, dry running the test procedures, final preparation before starting test, actual test execution, data management during execution, SIPRNet operations reporting requirements, formal OT&E reports during execution, and other considerations during test execution.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, para Encl 6. 5.b. & c; AFI 99-103, para 2.6.8 and Chapter 8; AFOTEC OT&E Guide, paras 1.6, 4.12.5, 4.12.6, and Chapter 5.</p> <p>Inputs: Test Plan, DMAP, DTP, Approved TRR.</p> <p>Key Actions:</p> <p>_____ Conduct final preparation actions prior to dedicated OT&E start.</p> <p>_____ Conduct dry runs. (AFOTEC OT&E Guide, para 5.7)</p> <p>_____ Execute deployment checklist. (AFOTEC OT&E Guide, para 5.3)</p> <p>_____ Execute test procedures.</p> <p>_____ Conduct, as required, appropriate test execution reporting.</p> <p>TD Notes:</p> <ul style="list-style-type: none"> - Become familiar with all reporting requirements during test execution. - Become familiar with information release restrictions. - Be aware of Pause and Stop test procedures; discuss prior to test start what would necessitate a pause or a stop. - Understand procedures for access to test execution (SPO, contractor, DOT&E). - Understand AFOTEC/CC's policy on communicating with SPO during test execution (see OT&E Guide paragraph 5.2). <p>Outputs: Data, appropriate execution reports.</p> <p>Points of Contact: A3, AFOTEC/SE.</p>

Cert Letter

Execute IOT&E

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Table 3. Space OT&E Model Activities


Programmatic Description	Test Director Actions
<p>OT&E (Phase 2) Final Report (OTA) FRP minus 45 days</p> <p>AFOTEC expects a fully production representative system to be delivered to execute the dedicated OT&E. Representative system users and maintainers are also required to execute the OT&E.</p> <p>The results of the OT&E are documented in an AFOTEC final report. This report will make a determination of effectiveness and suitability, rate the COIs, and determine the overall mission capability of the system. Any limitations/shortfalls encountered during test are documented, along with any impacts observed/expected in the operational environment.</p> <p>STATUS: _____</p>	<p>References: DoD 5000.02, Encl 4; AFI 99-103, Chapter 7; AF T&E Guidebook, Chapter 10; AFOTEC OT&E Guide, Chapter 6.</p> <p>Inputs: IOT&E Plan, TEMP, IOT&E data, Last Test Event.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Tailor and execute program management network for IOT&E Report. _____ Refer to the current AFOTEC-Intranet IOT&E final report template. _____ Share IOT&E observations with user/SPO to ensure understanding and facilitate deficiency corrective actions. _____ Ensure any observed deficiencies are entered into the deficiency reporting system. _____ Coordinate IOT&E Report for AFOTEC/CC approval. (AFOTEC OT&E Guide, Atch A) _____ If full report cannot be produced in time for the decision, obtain permission to produce an Interim Summary Report (ISR). (AFOTEC OT&E Guide, para 6.6) _____ Execute hotwash and capture lessons learned. (AFOTEC OT&E Guide, Atch A) _____ Following submission of final report, begin closeout activities as appropriate. _____ Document actual savings from IDT/OT (\$, time, test assets) in the report <p>TD Notes:</p> <ul style="list-style-type: none"> - Don't share final conclusions prior to AFOTEC/CC approval. - Report must be released 45 days prior to decision review. - Template "lock-down" for the final report, the point where the test team does not have to update the final report format to a new template version, is after approval of the test readiness review. <p>Outputs: Approved IOT&E Report, lessons learned input, deficiency reports.</p> <p>Points of Contact: A3, Test Team.</p>

**IOT&E
Report**

Timeline Legend:  = User Product  = SPO Product  = ITT Product  = AFOTEC Product

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Table 3. Space OT&E Model Activities

Programmatic Description	Test Director Actions
<div data-bbox="138 604 235 655" data-label="Text">  </div> <p>TEMP Update (SPO/RTO/OTA/MAJCOM OT)</p> <p>FRP minus 45 days</p> <p>The SPO, using the ITT, updates the TEMP by recording: the critical technical parameters; integrated master test schedule (to include but not limited to acquisition milestones, development schedule, integrated DT/OT and OT activities); T&E management responsibilities; detailed DT strategy and objectives; dedicated OT&E readiness entrance and exit criteria; and final T&E resources.</p> <p>AFOTEC provides an updated input, using appropriate IOT&E findings. Part III contains the integrated DT/OT and OT test events. Part III OT&E details based on the test plan which include 1) COIs; 2) measures/identified standards and associated criteria reflecting the CPD; 3) OT&E events with configuration description, objectives, scenarios, scope, methodology integrated test opportunities, and limitations; 4) entrance criteria for starting dedicated IOT&E. Part IV OT&E resources include funding, manpower and test articles/ capabilities. If there are any changes to threat/range limitations, detail them in the TEMP update.</p> <p>STATUS: _____</p>	<p>References: DoDI 5000.02, Encl 4 and para Encl6.2.b; DAG, para 9.6.2 and para 9.10 (format); AFI 99-103, para 5.14; AF T&E Guidebook, para 5.8; AFOTEC OT&E Guide, para 1.14.4.</p> <p>Inputs: CPD, test plan, TRP, Enabling CONOPs, Previous TEMP.</p> <p>Key Actions:</p> <ul style="list-style-type: none"> _____ Use test plan to build OT section of TEMP. _____ Use TRP to build resource section of TEMP. _____ Maximize integrated DT/OT opportunities throughout TEMP. _____ Ensure system readiness for OT&E certification requirements and RTT review process are addressed. (see TDT topic 2). _____ Ensure appropriate fidelity of OT activities (e.g., OAs, IOT&E, etc). _____ Ensure executable program schedule. _____ Follow-up on submitted comments. <p>TD Notes:</p> <ul style="list-style-type: none"> - If there is no further AFOTEC involvement in the program, the operational test portion of the TEMP should be authored by the MAJCOM operational test organization. - If FOT&E is required, the TEMP should contain appropriate discussion (see below). (DoD 5000.02, para Encl 2.6.d.(6) & (14), para Encl 2.7.c.(1).(d) & c.(3), para, Encl 6.5, AFI 99-103, para 2.6.3, para 4.6, AFOTEC OT&E Guide, para 4.12.7 <p>Outputs: TEMP, AFOTEC results from IDT/OT and dedicated OT&E, future AFOTEC OT (if required).</p> <p>Points of Contact: Program office, ITT</p>

NOTE:

FOT&E is the continuation of operational test and evaluation (OT&E) after IOT&E, QOT&E or MOT&E and is conducted by AFOTEC. FOT&E answers specific questions about unresolved test issues. FOT&E verifies the resolution of I/Q/MOT&E deficiencies or shortfalls determined to have substantial or severe impact(s) on mission operations. FOT&E completes T&E of areas not finished or deferred during I/Q/MOT&E if these areas are determined to have substantial or severe impact(s) on mission operations. Additionally, FOT&E may be conducted on block upgrades, modifications, or pre-planned product improvements following completion of I/Q/MOT&E at the request of the MAJCOM and acceptance by the AFOTEC/CC. A follow-on OT activity not meeting this definition of FOT&E is designated as a Force Development Evaluation (FDE) and conducted by the MAJCOM.

Should FOT&E be required, follow the planning, execution, and reporting guidance for IOT&E.

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Section 6

Topic 1.

Applying Design of Experiments for Operational Test

There are numerous techniques for designing a test. Techniques for designing a test vary from random selection of test points, scenario or operational profiles, physics and engineering-based test points, to statistical-based techniques. Among the statistical-based techniques, Design of Experiments (DOE) is a powerful and efficient technique for operational testing.

Operational Test

Operational test can be defined as conducting test: 1) using an operationally representative system; 2) on operations supporting a capability; 3) with actual operators; and 4) under realistic conditions, to include threats. Selecting the particular realistic conditions to use during the test is a major component of test design. DOE provides the techniques and procedures to select these test points, providing coverage of the battlespace as well as statistically defensible conclusions.

The Operations and the Battlespace

The system (or system of systems) under test is the material solution to providing a capability. A capability is the potential to “do something.” The “do something” is the operation. Any test of a system must define the operation or operations the system enables. The operations take place within the battlespace. The battlespace can be described by a set of factors, each factor with a set of possible levels or descriptors. For operational testing, the factors should be meaningful to the user or operator (as opposed to physics or engineering). Thus, a battlespace condition is a set of factors with each factor set to a given descriptor. The battlespace conditions are the set of all possible combinations of the factors and descriptors. Obviously, the number of possible battlespace combinations can be very large—impossibly large to test each condition or point. A significant challenge for operational test is choosing which conditions to test under, given it is impossible to test the entire set of battlespace conditions.

Type of Answer - Characterize

There are several purposes or types of answers a test can provide. The purpose of a test design sets the guidelines for choosing the (battlespace) test conditions. If the purpose of a test design is to find problems, then there are techniques to maximize the chances of finding problems. Similarly, if the purpose of test is to characterize performance, then DOE is a powerful and efficient technique. Characterizing performance means covering the breadth of the battlespace conditions, determining what factors influence the outcome of an operation, and how they influence an operation. DOE provides the techniques, procedures, and tools to characterize performance. DOE techniques focus on the ability to identify what factors or combination of factors affect the operation and how they affect the operation. DOE techniques allow for statistical analysis of the data to reach defensible, credible conclusions.

DOE Techniques

A basic DOE technique is the selection of operational test points that are “balanced” across the factors. Balancing factors allows one to contrast the performance between different levels of a factor and conclude whether that operational factor affects the operation and how it affects the operation. If a factor is not “balanced,” it is difficult, if not impossible, to draw a defensible, credible conclusion about that factor. DOE techniques allow multiple factors to be varied at once — gaining efficiency both in the number of operational test points as well as confidence in the conclusions. Using the DOE techniques may lead to operational test points that would seldom exist in actual operations—however, the purpose is not to build a test that reflects the frequency of occurrence (operational profile testing), but rather the performance when the conditions do occur.

Another technique involves the power of a test and the sample size. This drives the confidence or risks in drawing conclusions. Enough operational test points, or sample size, must be selected (in a balanced fashion) to be able to detect a difference in performance between the levels of a factor. The ability to detect a difference is the power of a test. Increasing factors in a test or replicating or rejecting test points increases the power of a test. Increasing the number of factors is preferred because it also represents a larger portion of the battlespace.

DOE in IDT/OT

DOE is a powerful enabler for IDT/OT. An underlying premise of DOE is a test-learn-test cycle. DOE supports a strategy of IDT/OT where one influences early testing by identifying operational conditions, screening the conditions to learn what is working and what isn't, investigating and fixing issues, and then confirming the performance under operational conditions. DOE can be used throughout IDT/OT to keep the focus on what conditions impact operations.

An example of using DOE to enable integrated DT/OT is the Laser JDAM (LJDAM) urgent operational need (UON). The user and developer had previously conducted testing of the LJDAM and had released 12 munitions under a variety of conditions (documented with factors, descriptors, and the measures). These 12 munitions were not planned by the developer based on DOE principles. However, AFOTEC considered these 12 munitions to be near-production representative resulting in a high likelihood that some of these munitions could be used in an OT&E design. Using DOE principles, we were able to identify DOE-based designs within the employment scenarios of the 12 Development Test munitions. DOE principles were used to combine the partial designs for the DT munitions with the OT&E design resulting in an OT design with 4 munitions added to the DT&E partial designs. With the addition of one munition for a demonstration, the DT results were leveraged into an OT&E consisting of only 5 munitions. The result was a shorter schedule and reduced cost, as well as more assets to employ in the AOR.

Topic 2.

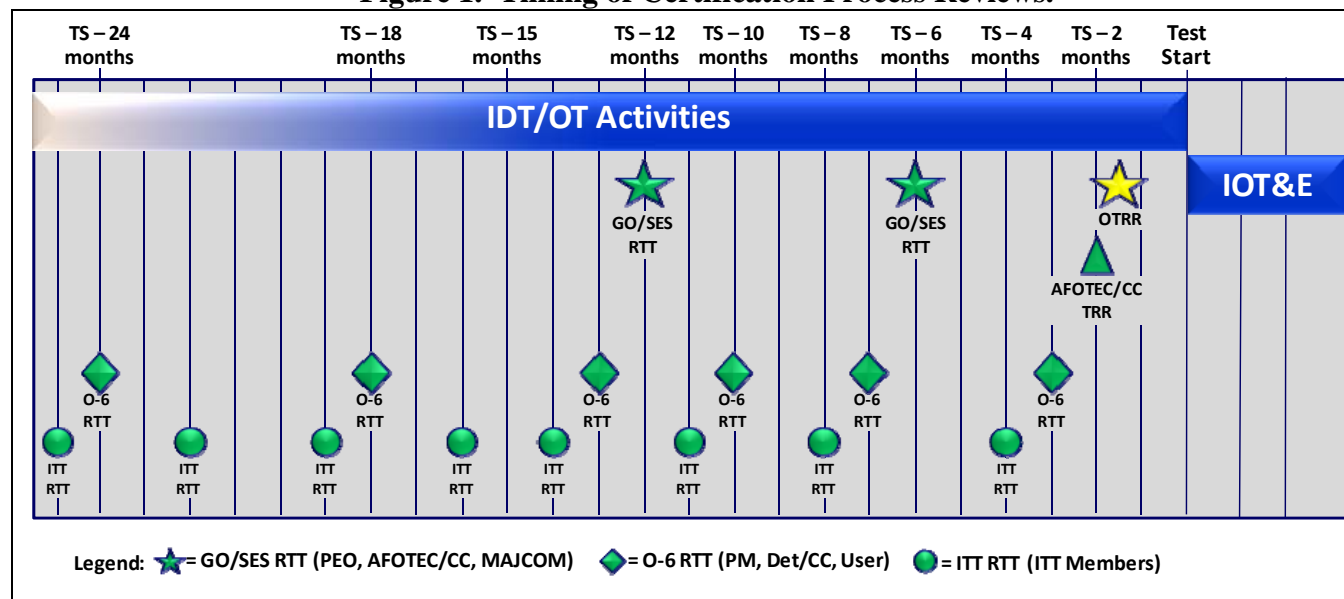
Readiness-to-Test (RTT) Approach to Improve the Operational Test Readiness Review (OTRR) Process

AFMAN 63-119, *Certification of System Readiness for Dedicated Operational Testing*, currently requires the readiness for dedicated OT&E certification be a continuous effort, not a single event in time. AFOTEC provides vital operational test planning insight to reduce risk and assist program managers (PM) reach successful certification of system readiness for dedicated OT&E. However, the current process falls short, increasing a program's risk for cost and schedule. Therefore, AFOTEC institutes a Readiness-to-Test (RTT) approach for all Acquisition Category I and II programs. AFOTEC test directors (TD) must communicate the RTT approach to PMs during their initial meeting.

The RTT approach provides an improved opportunity to identify and reduce risk when fixes and mitigation can be accomplished at lower cost. The approach entails frequent integrated test team (ITT) led RTTs leading to O-6 level RTTs, culminating with GO/SES level RTTs, as required, that include the acquisition executive or delegate (see Figure 1). The ITT will prepare for RTTs using the certification templates in AFMAN 63-119 to identify any areas not supporting test readiness, including issues needing elevation. Importantly, the PM and AFOTEC test director (TD) coordinate and prepare only one set of templates. Issues they identify needing resolution beyond their level are raised to the appropriate leadership level. The PM and AFOTEC TD will jointly brief the RTT status at each review throughout the process. The RTT approach culminates with an AFOTEC test readiness review (TRR) to the Commander, preceding the Program Executive Officer (PEO) OTRR, to support successful PEO certification of system readiness and AFOTEC/CC acknowledgment of certification.

Thirty-two certification templates (reference AFMAN 63-119, Figure 2.1) include a broad range of subjects that have historically impacted systems transitioning from DT&E to dedicated operational testing. Since the templates are not program specific, they should be tailored by the ITT to fit specific programs or groups of programs. The templates are arranged in three groups: Test Planning and Documentation; System Design and Performance; and Test Assets and Support.

Figure 1. Timing of Certification Process Reviews.



Notes:

RTT = Readiness-to-Test review - An approach consisting of regularly scheduled reviews of the system's readiness for dedicated operational test, co-briefed by the PM and AFOTEC TD to ITT, O-6, and general officer/senior executive service level groups.

AFOTEC/CC TRR = Test Readiness Review - AFOTEC briefing by the TD to the AFOTEC/CC normally 60 days prior to test start to present the status of system and test team readiness. The objective is to gain AFOTEC/CC approval to begin execution of the OT&E.

OTRR = Operational Test Readiness Review - Program Office briefing required by DoD 5000.02 and AFI 99-103 and normally presented by the PM to the PEO 45 days prior to OT&E start for certification of system readiness for dedicated operational testing. The OTRR is based on DT results, an assessment of the system's critical technical parameters performance, analysis of identified technical risk and resolution during DT, and a review of OT&E entrance criteria.

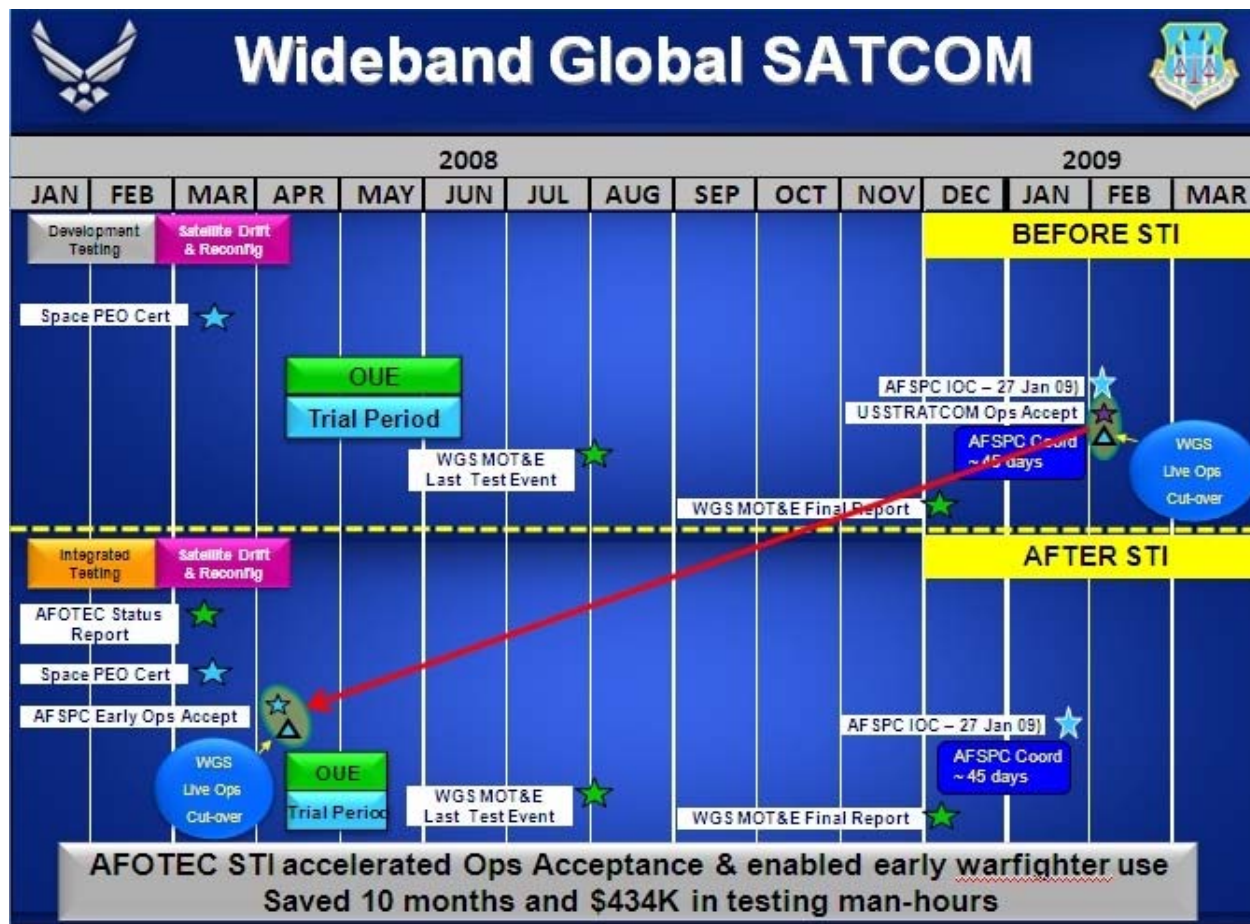
Topic 3.
AFOTEC Space System OT&E Successes in Implementing the Dec
2007 Section 231 Report

Section 231 of the John Warner National Defense Authorization Act for Fiscal Year 2007, Public Law 109-364, directed the Under Secretary of Defense for Acquisition, Technology, and Logistics and the Director of Operational Test and Evaluation to review Department of Defense policies and practices on test and evaluation and amend policy as appropriate. DoD delivered a report to Congress in December 2007 complying with the Section 231 direction. The report reviewed current policy and practices, summarized recent studies that made recommendations on Test and Evaluation (T&E) policy, and developed the rationale for test and evaluation principles for traditional and emerging acquisition approaches. Policy initiatives identified in the report are now codified in the recent release of DoDI 5000.02.

The following policy guidelines are to be considered with respect to both traditional and emerging acquisition approaches:

- Testing and evaluation should concentrate on measuring improvements to mission capability and operational support based on user needs;
- Testing and evaluation programs should experiment in the sense that they should learn and understand the strengths and weaknesses of a system and its components, and the effect on operational capabilities and limitations. Decision makers (e.g., managers, engineers, and users) can then incorporate test results into corrective actions or system enhancement initiatives;
- Developmental and Operational Test activities should be integrated and continual to the maximum extent feasible;
- Testing and evaluation should begin early, be more operationally realistic, and continue through the entire system lifecycle;
- Evaluation should be conducted in the mission context expected at time of fielding to the user and beyond and should be expressed in terms of the operational significance of the test results;
- Evaluations should include a comparison against current mission capabilities so that measurable improvements can be determined;
- Evaluations should take into account all available data and information;
- Test and evaluation should exploit the benefits of appropriate models and simulations.

Provided below is a compilation of AFOTEC operational tests on aircraft, munitions and space systems which show success stories for saving time and dollars as well as showing the programs' compliance with the Section 231 Report guidelines.



Integrated DT/OT

- Led WGS integrated testing; released AFOTEC status report to inform USSTRATCOM acceptance; IT and agile reporting enabled Warfighter use 10 months early

Comparison to existing data

- WGS provides warfighter with 10X bandwidth capability vs DSCS satellites and adds two-way Ka band connectivity
- Augments Global Broadcast Service and provides spatial frequency reuse and cross-banding for maximum interoperability of terminals

Assessment of mission capability and operational significance

- Evaluated C2 system upgrades

Data and information taken into account

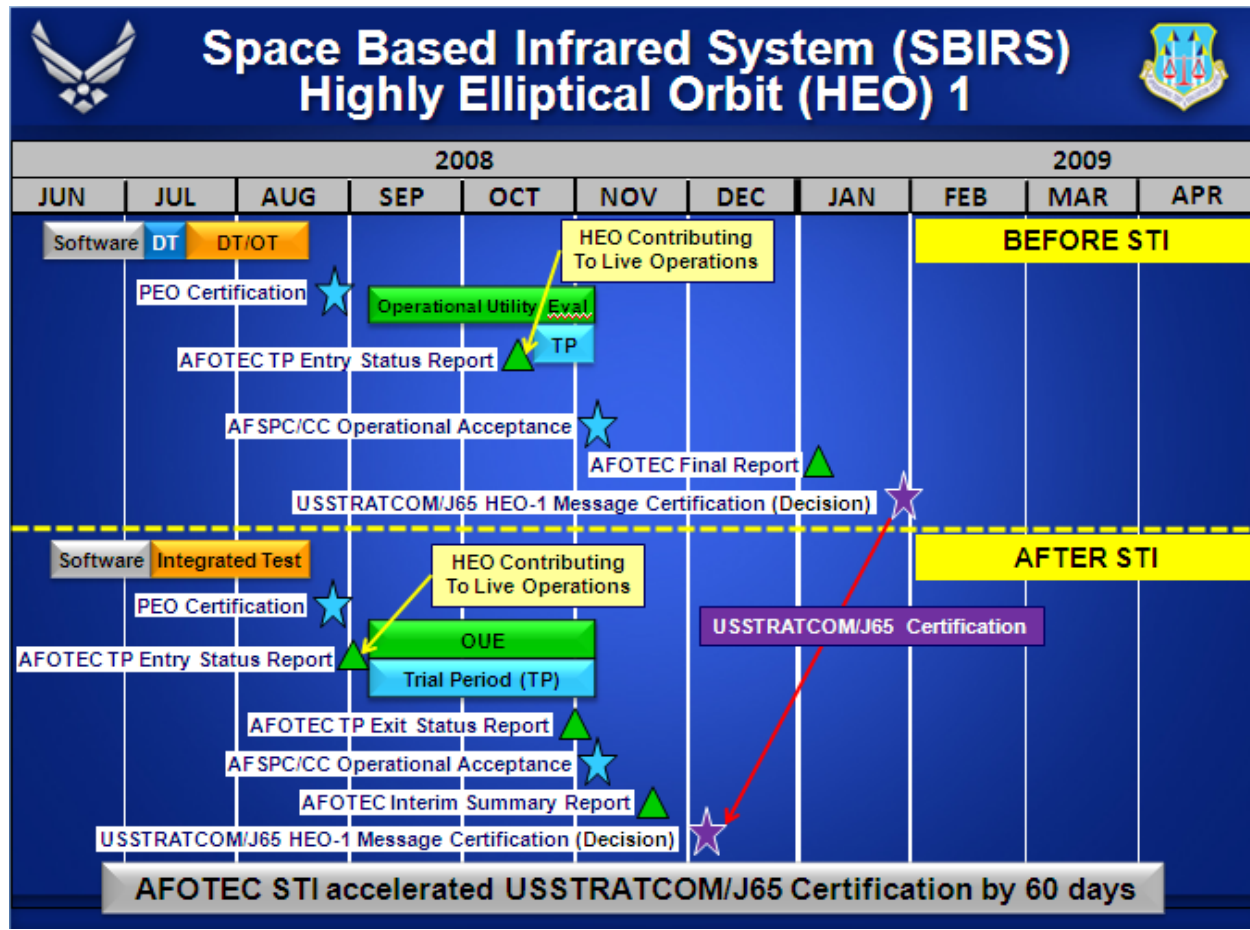
- Leveraged DT/OT data which satisfied over 30% of MOT&E evaluation requirements

Provide assessments of operational effectiveness & suitability

- Final MOT&E report characterizes operational effectiveness, suitability, and mission capability to support the AFSPC/CC IOC decision

Live, virtual, and constructive system and operational environment

- Used CRANE Weather Model to evaluate WGS capabilities and performance within certain climatic environments as well as Satellite Tool Kit to evaluate field-of-view coverage areas



Integrated DT/OT

- Coordinated closely and integrated with SBIRS System Wing and contractor team during several SBIRS system test periods and mission regression testing after each major software upgrade

Comparison to existing data

- Baselined current capability using existing DSP constellation, other national IR sensors, and SBIRS ground segment

Assessment of mission capability and operational significance

- Testing utilized actual payload, ground segment, and operational crews

Data and information taken into account

- Led integrated testing with contractor and shared data from testing with contractor and SBIRS System Wing

Provide assessments of operational effectiveness & suitability

- Interim Summary Report provided assessments of SBIRS operational effectiveness and suitability

Live, virtual, and constructive system and operational environment

- Used M&S to supplement live mission operations
- Simulated a wartime environment using threat-representative strategic and theater missiles flying operationally realistic threat trajectories and range

